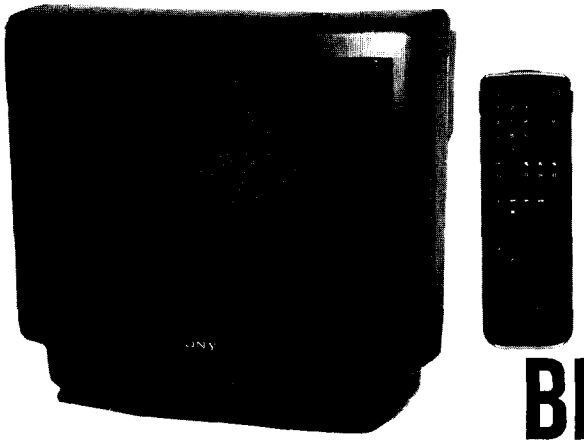
KV-M2150E/M2151E
RM-826

SERVICE MANUAL

Spanish Model

KV-M2150E
Chassis No. SCC-D87L-A
KV-M2151E
Chassis No. SCC-D87K-A



BE-2A CHASSIS

MODELS OF THE SAME SERIES	
KV-M2150E/M2151E	KV-M1420E/M1421E
KV-M2140E/M2141E	KV-M1430E/M1431E
KV-M1620E/M1621E	

SPECIFICATIONS

【KV-M2150E/M2151E】

Television system	B/G/H
Color system	PAL
Channel coverage	VHF : E2-E12 UHF : E21-E69 CABLE TV : S1-S20
Picture tube	HI-BLACK TRINITRON Approx. 55 cm (21 inches) (Approx.51cm picture measured diagonally) 100° degree deflection
Inputs	21-pin connector : CENELEC standard RGB input VCA Audio/Video input jacks : phono jacks S-Video input jack
Outputs	Headphones jack : minijack 21-pin connector : TV output
Sound output	6 W (Music)
Power consumption	70.5Wh (KV-M2150E) 73.5Wh (KV-M2151E)
Dimensions	Approx. 510x465x490 mm (w/h/d)
Weight	Approx. 24 kg

【RM-826】

Remote control system	infrared control
Power requirements	3V dc 2 batteries IEC designation R6 (size AA)
Dimensions	Approx. 75×221×23mm (w/h/d)
Weight	Approx. 230g including batteries
Accessories supplied	IEC designation R6 batters (2)
Supplied accessories	RM-826 Remote Commander (1) IEC designation R6 batteries (2)

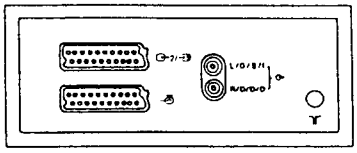
Design and specifications are subject to change without notice.

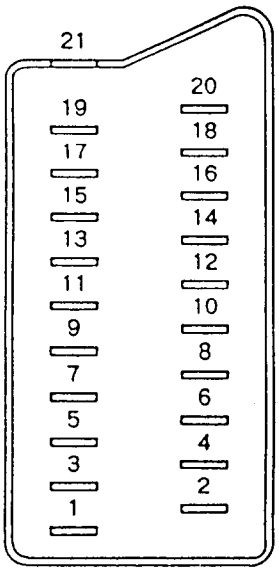
MICROFILM

TRINITRON® COLOR TV

SONY®

21 pin connector (, 2/)





Pin No.	1	2	Signal	Signal level
1	○	○	Audio output B (right)	Standard level: 0.5Vrms Output impedance: Less than 1kohm*
2	○	○	Audio input B (right)	Standard level: 0.5Vrms Input impedance: More than 10kohms*
3	○	○	Audio output A (left)	Standard level: 0.5Vrms Output impedance: Less than 1kohm*
4	○	○	Ground (audio)	
5	○	○	Ground (blue)	
6	○	○	Audio input A (left)	Standard level: 0.5Vrms Input impedance: More than 10kohms*
7	○	●	Blue input	0.7V ± 3dB, 75ohms, positive
8	○	○	Function select (AV control)	High state (9.5 – 12V): Part mode Low state (0 – 2V): TV mode Input impedance: More than 10kohms Input capacitance: Less than 2 nF
9	○	○	Ground (green)	
10	○	○	Open	
11	○	●	Green	Green signal: 0.7V ± 3dB, 75ohms, positive
12	○	○	Open	
13	○	○	Ground (red)	
14	○	○	Ground (blanking)	
15	○	–	Red input	0.7V ± 3dB, 75ohms, positive
	–	○	(S signal) croma input	0.3V ± 3dB, 75ohms, positive
16	○	●	Blanking input (Ys signal)	High state (1 – 3V) Low state (0 – 0.4V) Input impedance: 75ohms
17	○	○	Ground (video output)	
18	○	○	Ground (video input)	
19	○	○	Video output	1V ± 3dB, 75ohms, positive Sync: 0.3V (– 3, +10dB)
20	○	–	Video input	1V ± 3dB, 75ohms, positive Sync: 0.3V (– 3, +10dB)
	–	○	Video input/Y (S signal)	1V ± 3dB, 75ohms, positive Sync: 0.3V (– 3, +10dB)
21	○	○	Common ground (plug, shield)	

○ connected ● unconnected (open) * at 20Hz – 20kHz

4 pin connector ( )

Pin No.	Signal	Signal level
1	Ground	
2	Ground	
3	Y (S signal) input	1V ± 3dB, 75ohms, positive Sync: 0.3V ; ⅛ dB
4	C (S signal) input	0.3V ± 3dB, 75ohms, positive

TABLE OF CONTENTS

CAUTION

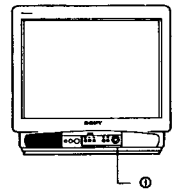
SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

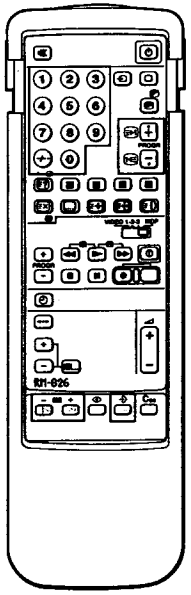
SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1
GENERAL

1-1. PRESETTING OF CHANNELS

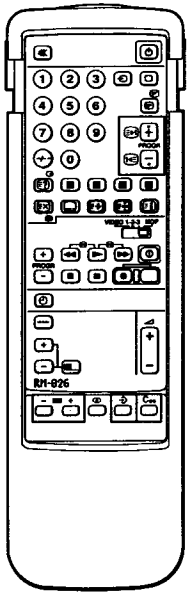




Before viewing the TV programmes your need to preset TV channels. There are 60 spaces available for storing these channels. TV stations broadcast their channels at certain frequencies. You must preset these channels to programme numbers on the TV. Slide open the full-function side of the Remote Commander to reveal preset buttons.

Automatic presetting of channels

Action	Result
1 Turn on the TV using the power switch ⏻ on the set.	
2 Press the ⇨ PRESET button.	You are now in the preset mode. The programme number flashes.
3 Press either the number buttons or PROGR +/– to select the programme number on which you want to preset the channel. **Note:** in the case of two digit numbers, first press -/--, then the two numbers.	The selected programme number will be indicated.
4 Press the ⇔ + or – button repeatedly, until the desired channel is tuned in.	The scale with the frequency band changes.
5 Repeat steps 3 and 4 for all other channels.	
6 Press the ⇨ PRESET button to store the channels.	All channels are now stored. The programme number stops flashing.



How to skip programmes

Since you have 60 programmes at your disposal, you may want to skip vacant programme positions. This means that they are skipped when you press the PROGR +/– buttons.

Action	Result
1 Press the ⇨ PRESET button.	You are now in preset mode, the programme position flashes.
2 Use PROGR + or – to select the programme position you want to skip.	The selected programme position appears.
3 Press C00.	
4 Repeat steps 2 and 3 to skip other programmes.	
5 Press the ⇨ PRESET button.	The programme position is now skipped. You are back in TV mode.

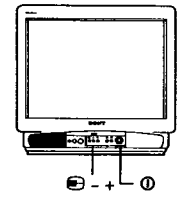
How to fine tune a channel manually

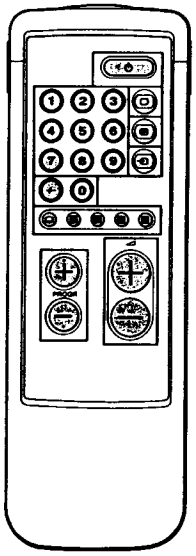
If the reception of a stored channel is not satisfactory, you can fine tune the channel manually.

Action	Result
Press the ⇔ + or – button until the reception is good.	The channel is now fine tuned.

Note: By pressing the respective programme number the automatic fine tuning will be restored.

1-2. BASIC TV OPERATION





This section introduces you to the basic control functions which are available on the TV set and on the simple side of the Remote Commander.

How to turn the TV on and off

Action	Result
Turning on	
Press the power switch ⏻ on the set.	The TV will turn on. **Note:** If the screen remains blank, the TV may be in standby mode. In this case, press ▢.
Turning off	
A Temporarily Press ⏻.	The TV is now in standby mode. Press ▢ or any number button to return to TV mode.
B Completely Press the power switch ⏻.	The TV will turn off.

How to select programmes

Before selecting programmes make sure that you have preset channels.

Action	Result
Press PROGR +/– or the respective number button. **Note:** In the case of two digit numbers first press –/-- and then the two number buttons.	The selected programme is displayed.

On the set:
Press the + or – button for programme selection.

How to adjust the volume

Action	Result
Press ◿ + or –.	The volume markers will appear and the volume is adjusted accordingly.

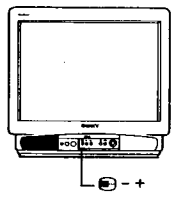
On the set:
Press ▣ until the ◿ symbol is displayed, then adjust with the +/– buttons.

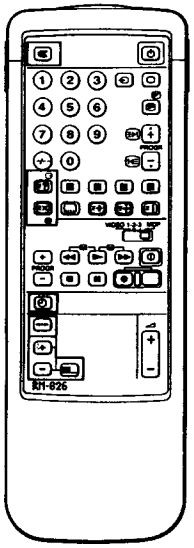
How to use additional functions

Viewing of Teletext: (only for KV-M2151E)
Press ▣/▣. To return to TV mode, press ▢.

Viewing of the video input:
Press ⇥. To return to TV mode, press ▢.

1-3. ADVANCED TV OPERATION





This section introduces you to the advanced control functions which are available on the full function side of the Remote Commander.

How to adjust the picture

Although the picture has been adjusted at the factory, you might want to adjust it to your own taste. For modifications please follow the steps:

Action	Result
1 Press button ▣ repeatedly, until the desired item is displayed (◑ contrast, ◕ colour intensity, ☼ brightness).	The symbol and the level indicator for the selected item is displayed.
2 Press button + or –.	The picture item is adjusted.

On the set:
Press button ▣ repeatedly in order to select the desired item, then adjust with button + or –.

To return to factory set levels:
Press the ⋯ button.

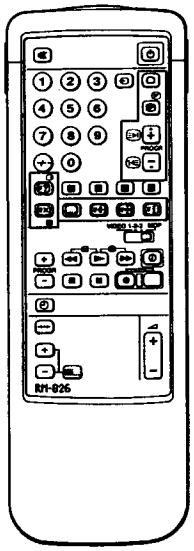
How to use the Sleep Timer

You can select a time after which the set goes automatically into standby mode. Press button ⏲ repeatedly until the desired time is displayed on the screen (30, 60, 90 minutes or 0 for cancelling the request).

Other functions

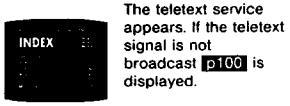
How to	Action	The resume normal picture/sound
Display the programme number.	Press ⓘ.	Press ⓘ again.
Mute the sound.	Press 🔇.	Press 🔇 again.
Request the time (only if teletext is available).	Press ▢.	Press ⏲ again.

1-4. TELETEXT OPERATION (KV-M2151E ONLY)



TV stations broadcast teletext programmes via the TV channels. To receive teletext programmes, use the buttons indicated in green on the full function side of the Remote Commander. With the simple side of the Remote Commander only the basic operation is possible.

How to view the teletext

Action	Result
1 Select the channel which carries the teletext service you wish to view.	The channel changes on the screen.
2 Press ▣/◩.	 The teletext service appears. If the teletext signal is not broadcast p100 is displayed.
3 Input three digits for the page number using the number buttons. **Note** If you make a mistake, type in any three digits, then re-enter the correct page number.	The numbers are entered on the screen. The requested page will appear in a few seconds.

To return to the TV mode:
Press ▢.

To change the teletext channels:
First press ▢ to return to TV mode, then repeat steps 1 to 3.

Note
If the signal of the TV channel is weak, teletext errors may often occur.
The ▢ has no function on this set.

How to use the Advanced Features of Teletext

How	Action	Result (on-screen display)
Request the index page.	Press ⊟ (INDEX).	 The index page appears.
Access the next or preceding page.	Press ⊞ (PAGE +) or ⊟ (PAGE −).	 The next or preceding page appears.

How to	Action	Result
Superimpose the teletext display on the TV programme	Press ▣/◩ once if you are in text mode or press ▣/◩ twice if in TV mode To return to the normal teletext display press ▣/◩ again.	 The teletext displays are superimposed on the TV programmes.
Prevent a teletext page from being updated or changed.	Press ⊞ (HOLD) To resume normal teletext reception, press ▣/◩ (TEXT/MIX).	 The HOLD symbol ⊞ appears on the screen and the chosen sub-page is held until you cancel.
Enlarge the teletext display.	Press ⊡ once to enlarge the upper half. Press twice to enlarge the lower half. Press again to restore the normal display.	 The upper half is enlarged.
Revealed concealed information (e.g. answers to a quiz).	Press ⊡ (REVEAL). Press again to conceal the information.	 The information is revealed.
Watch the TV programme while waiting for a requested page to be displayed.	**1.** Request the new page.	The numbers are entered.
	2. Press ⊡ (TEXT CL).	The TV programme is displayed and the requested page number and other teletext data appear at the top of the screen.
	3. When the requested page has been captured, the page number remains and the other data disappears.	
	4. Press ▣/◩ to view this page.	The requested page is displayed.

Some of the features may not be available depending on the Teletext service.

How to use the FASTEXT feature

FASTEXT feature allows you to access pages quickly with one key operation. When a FASTEXT page is broadcast, a colour coded menu appears at the bottom of the screen. Each coloured prompt corresponds to the coloured buttons on either side of your Remote Commander.

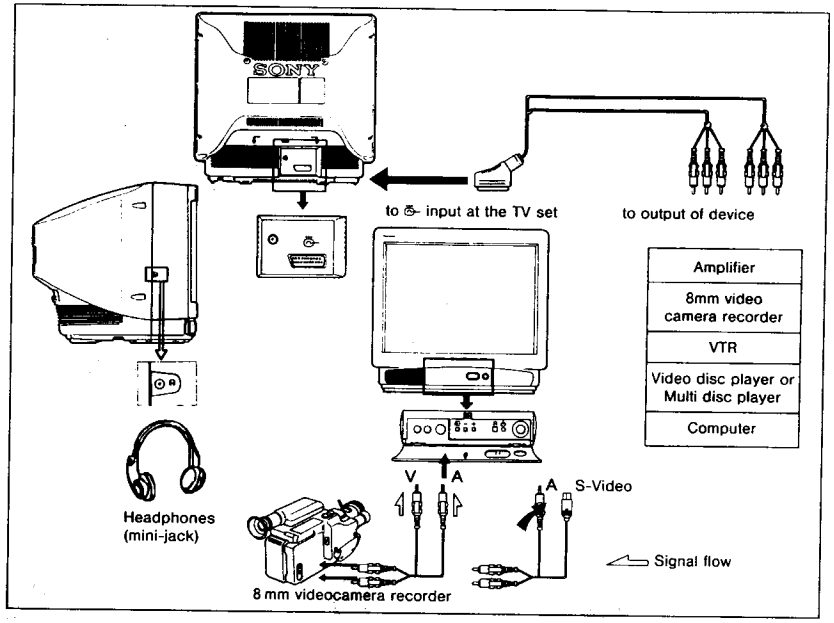
Operation

Action	Result
Press on the coloured buttons which corresponds to the coloured prompt on the teletext.	The selected teletext page appears.

Note
Correct FASTEXT operation depends on the necessary signals sent from the TV station.

1-5. OPTIONAL CONNECTIONS/OPERATIONS

How to connect additional Audio/video equipment



How to view the Video input signal

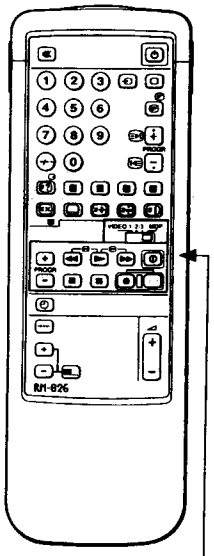
Press button ⊣⊙ in order to select the desired input mode (⊣⊙ for Audio/video signals from 21-pin EURO connector ⊶ or from the video/audio connectors V ⊙ A on the front; ⊣⊟ for S-video signals from the S-video (4-pin DIN) connectors on the front). Press button ▢ to return to TV mode.

On the set:
Press button ⊙ once, the symbols ⊣⊙, ▢, ⊣⊟, will appear on the screen, then press the + button to select the desired video input mode. Press ⊟ and + buttons again to return to TV-mode.

S-video input (Y/C input)
Video signals may be separated into Y (luminance or brightness) and C (chrominance) signals. Separating the Y and C signals prevents them from interfering with one another, and therefore improves picture quality (especially luminance). This TV is equipped with one S-video input jack through which these separated signals can be input directly.

Notes
- When you have Audio/video equipment connected to both the A/V connectors and the 21-pin terminal, make sure that both are not switched on at the same time, otherwise the picture could be incomplete.
- In case of sound and picture distortions move the VTR away from the TV set.

1-6. ADDITIONAL REMOTE COMMANDER OPERATION



How to Control Other Sony Video Equipment

By switching the VIDEO 1/2/3, MDP selector, you can operate most Sony video equipment (Beta VTR, 8mm VTR, VHS VTR, and video disc player).

1 Set VIDEO 1/2/3, MDP selector according to the desired video equipment.
VIDEO 1: Beta or ED Beta VTR
VIDEO 2: 8mm VTR
VIDEO 3: VHS VTR
MDP: Video disc player

2 Use the buttons in the indicated area to operate video equipment.

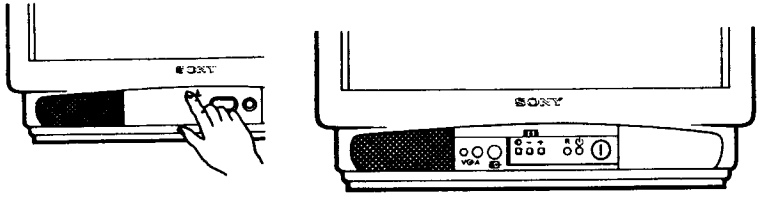
Note
When you use ● button, be sure to press this button and the one on the right simultaneously.

Notes
- If your video equipment is furnished with COMMAND MODE selector, set the selector to the same position as the VIDEO 1/2/3, MDP selector on the supplied Remote Commander.
- If the equipment does not have a certain function, the corresponding button on the Remote Commander will not work.

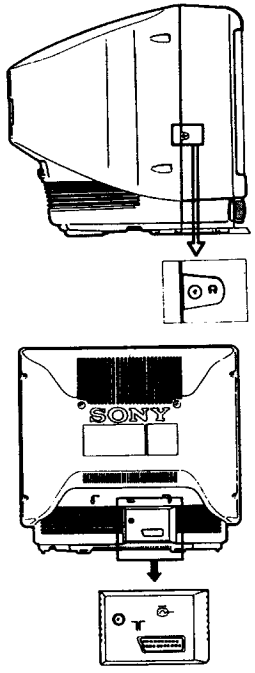
1-7. ADDITIONAL INFORMATION

Parts Identification

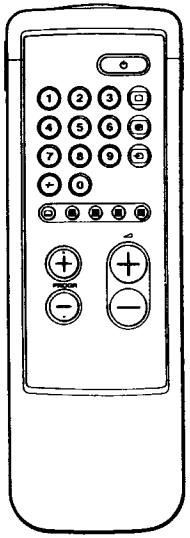
A



B



C



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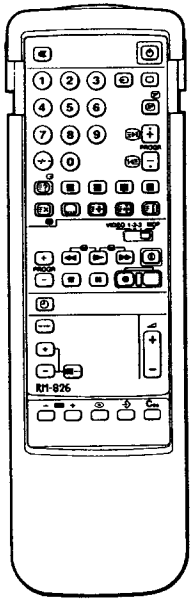


This section briefly describes the buttons and controls on the TV set and on the Remote Commander. For more information.

A TV set – Front

Sign	Name	
⏻	Main power switch	
⏻	Standby indicator	
V, A, S	Input jacks (Video/Audio/S-Video)	
	Function selector (Programme/ volume/input)	
- / +	Adjustment buttons for function selector	

B TV set – Rear

Sign	Name	
	Headphones jack	
	21-pin Euro-AV connector (RGB/ video input, TV output	
	Aerial terminal (IEC type)	

C Remote Commander – simple side

Sign	Name	
	Input mode selector	
	Teletext button	
	Fastext buttons	
	TV mode selector	
⏻	Standby button	
1,2,3,4,5, 6,7,8,9, and 0	Number buttons	
-/--	Double-digit entering button	
+/-	Volume control buttons	
PROGR +/-	Programme selector	

D Remote Commander – full function side

Sign	Name	
	Mute on/off button	
⏻	Standby button	
1,2,3,4,5, 6,7,8,9, and 0	Number buttons	
	Input mode selector	
	TV power on/TV mode selector button	
/	Teletext button	
-/--	Double-digit entering button	
	Request time display	
	Teletext operation buttons	
	Fastext buttons	
	On-screen display button	
	Sleep timer	
	Picture adjustment reset button	
+/-	Volume control	
PROGR +/-	Programme selector	
+/-	Picture controls	
VIDEO 1/2/3, MDP	Video equipment selector	
◀◀ ▶▶ ▶▶ ■ ❚❚ ●	Video equipment operation buttons	
Coo	Programme number clear button	
	Channel preset/store button	
- +	Tuning buttons	

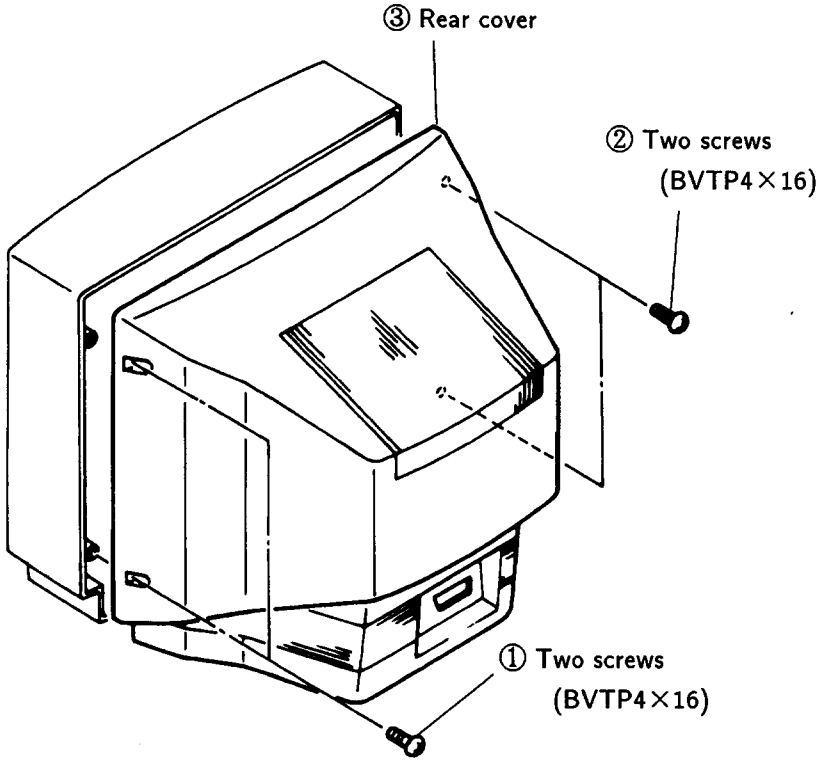
Troubleshooting

Here are some simple solutions to the problems which may affect the picture and sound.

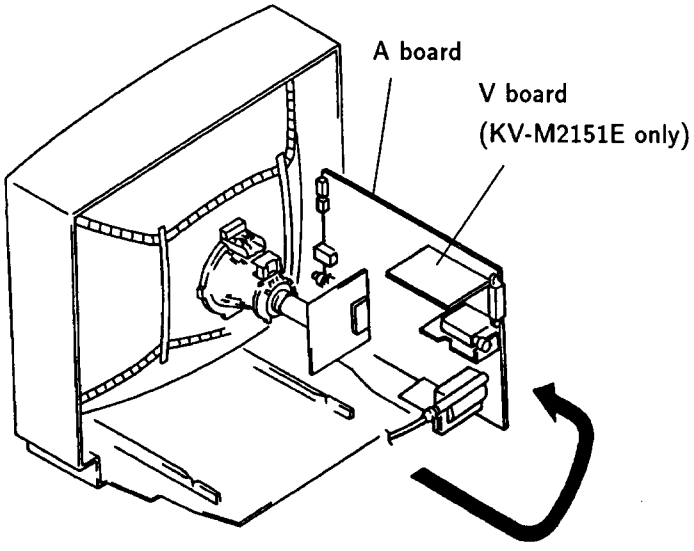
Problem	Checking and solution
No picture (screen not lit), no sound	• Connect the set to a working outlet. • Press the power switch ⏻. • If the standby indicator shines red, press the TV button on the Commander ○. • Check the aerial connection.
Poor or no picture (screen not lit), but sound good	• Adjust ◑, ○, and ◕ by pressing the + or - button (after selecting with the ⊜ button.
Good picture but no sound	• Press ◿ +. • If 🔇 is displayed on the screen, press 🔇 on the Remote Commander.
No colour for colour programmes	• Adjust ◕ with the + button after selecting with the ⊜ button. • Press →·←.
Snow and noise	• Check the aerial connections.

SECTION 2
DISASSEMBLY

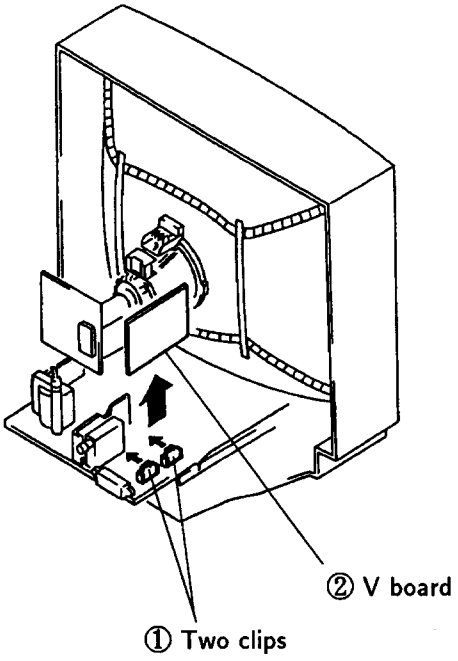
2-1. REAR COVER REMOVAL



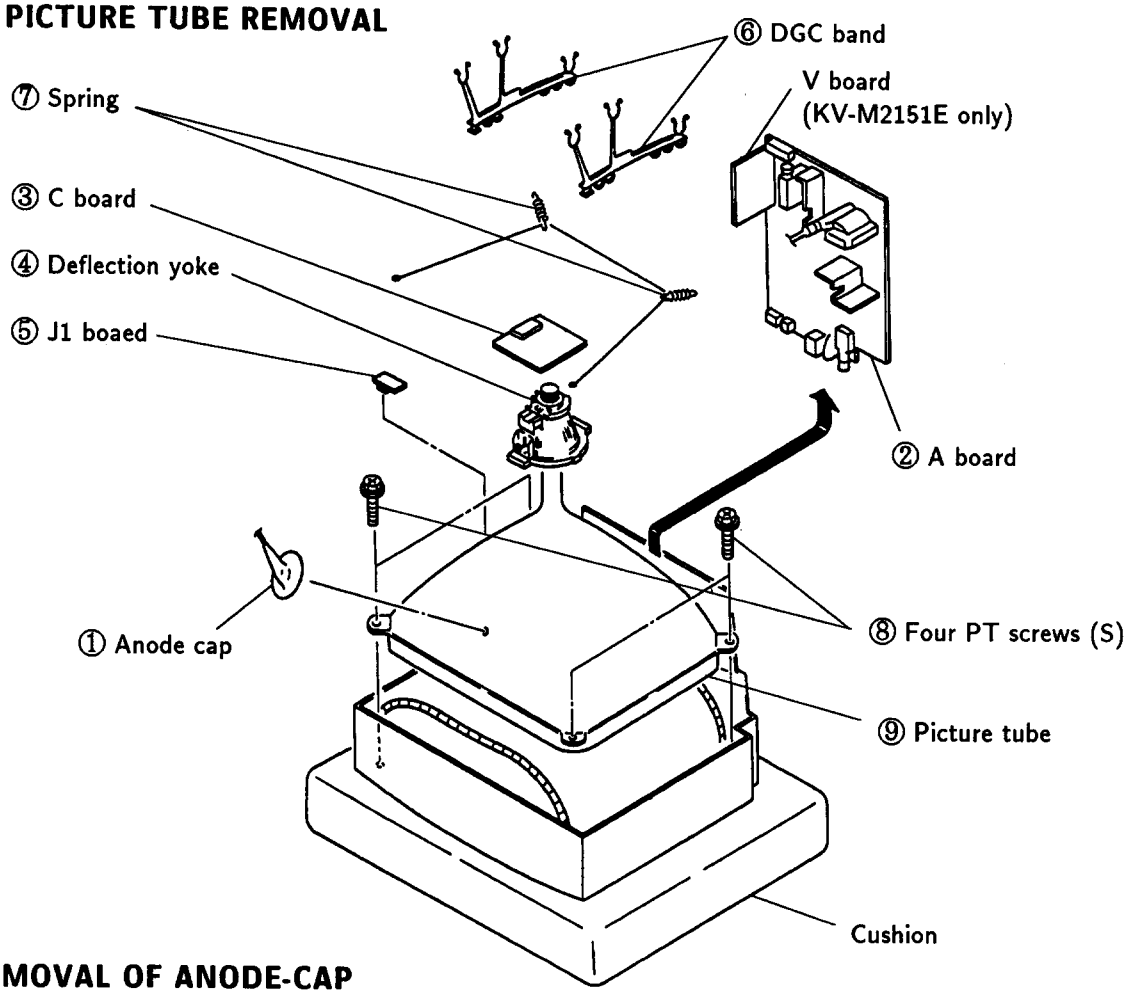
2-2. SERVICE POSITION



2-3. V BOARD REMOVAL (KV-M2151E only)



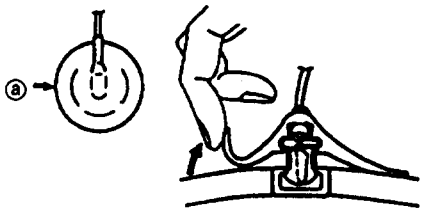
2-4. PICTURE TUBE REMOVAL



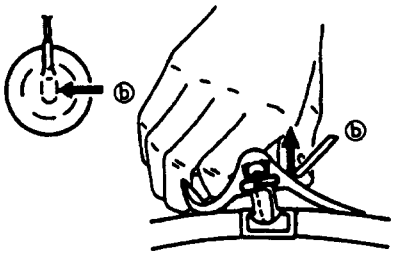
• REMOVAL OF ANODE-CAP

NOTE : Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT chield or carbon painted on the CRT, after removing the anode.

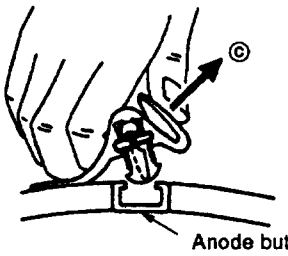
• REMOVING PROCEDURES



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.



② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.



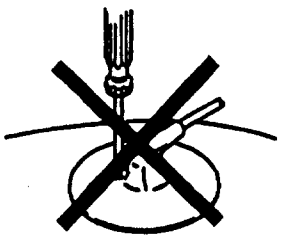
③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling up it in the direction of the arrow ⓒ.

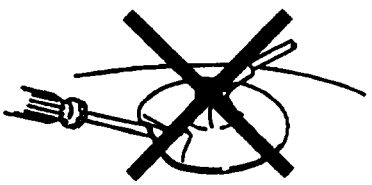
• HOW TO HANDLE AN ANODE-CAP

① Don't hurt the surface of anode-caps with sharp shaped material!

② Don't press the rubber hardly not to hurt inside of anode-caps!
A material fitting called as shatter-hook terminal is built in the rubber.

③ Don't turn the foot of rubber over hardly!
The shatter-hook terminal will stick out or hurt the rubber.





SECTION 3
SET-UP ADJUSTMENTS

● The following adjustments should be made when a complete realignment is required or a new picture tube is installed.

● These adjustments should be performed with rated power supply voltage unless otherwise noted.

The controls and switch below should be set as follows unless otherwise noted :

◑ CONTRASTcontrol ..... 80%(or Normal by commander)

☼ BRIGHTNESS control 50%

Perform the adjustments in order as follows:

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G 2) and White Balance

Note: Test Equipment Required.

1. Color bar/Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital multimeter
5. Oscilloscope

Preparation:

● Set the side of the unit with the PICTUE TUBE so that it faces east or west in order to reduce the influence of external magnetic force.

● Turn the power switch for the unit ON and erase the magnetic force using a degausser..

3-1. BEAM LANDING

Demagnetize with a degausser

1. Input a raster signal with the pattern generator.
   CONTRAST
   BRIGHTNESS } normal
2. Turn the raster signal of the pattern generator to red.
3. Move the deflection yoke backward, and adjust with the purity control so that red is in the center and blue and green are at the sides evenly. (Fig.3-1 - 3-3)
4. Move the deflection yoke forward, and adjust so that the entire screen becomes red. (Fig.3-1)
5. Switch over the raster signal to blue and green confirm the condition.
6. When the position of the deflection yoke is determined,tighten it with a deflection yoke mounting screw.
7. When landing at the corner is not right, adjust by using the disk magnets. (Fig.3-4)

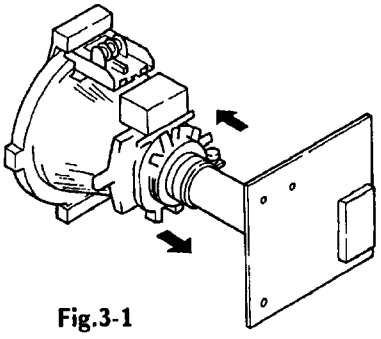


Fig.3-1

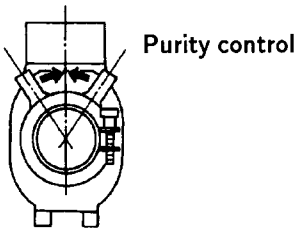


Fig.3-2

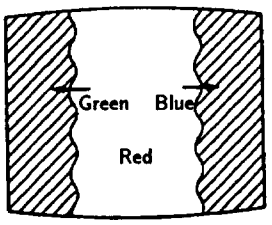


Fig.3-3

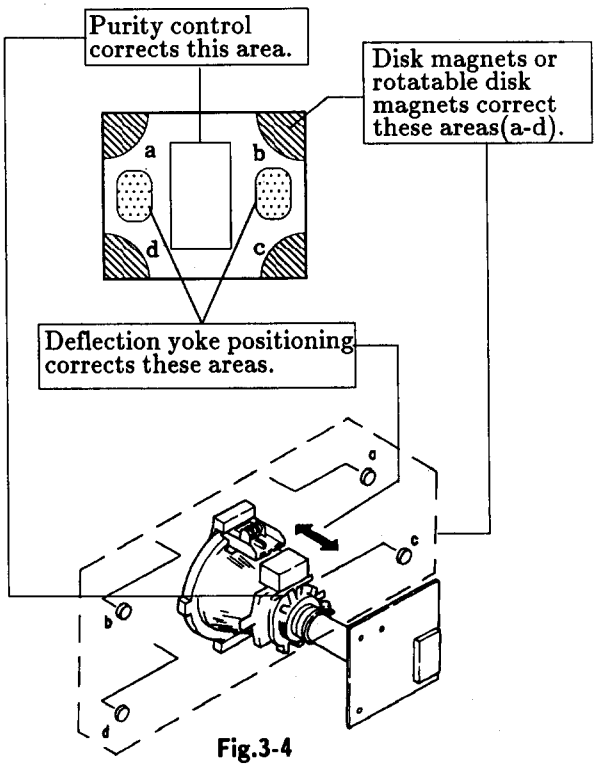


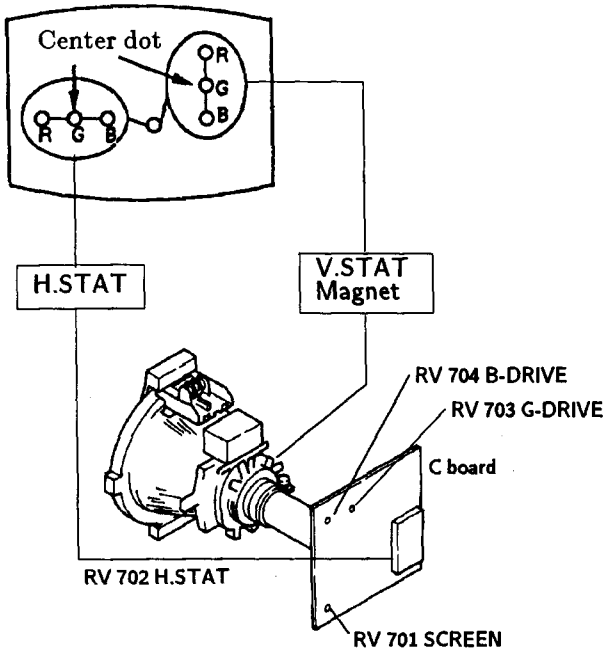
Fig.3-4

3-2. CONVERGENCE

Preparation:

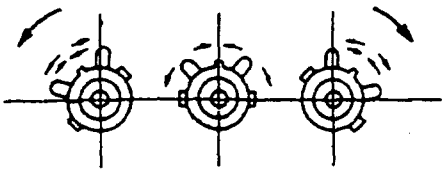
- Before starting, perform FOCUS, H.SIZE, and V. SIZE adjustments.
- Set BRIGHTNESS control to minimum.
- Feed in the dot pattern.

(1) Horizontal and Vertical Static Convergence

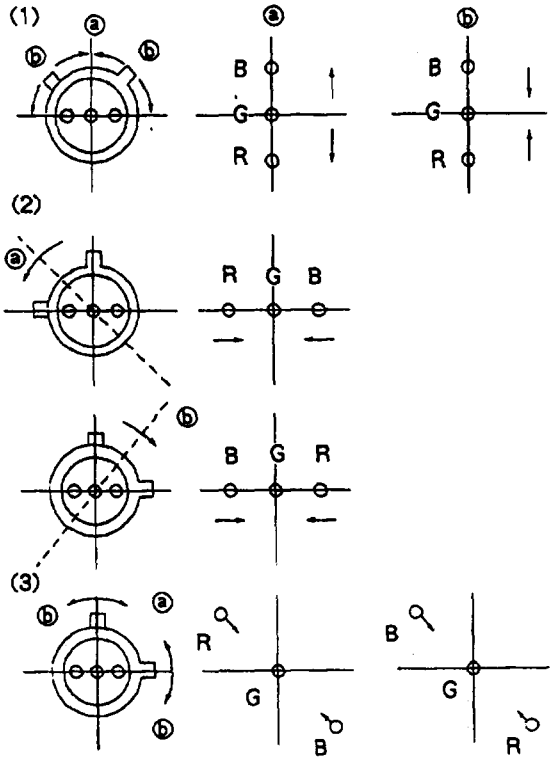


1. Adjust H.STAT VR to converge red, green and blue dots the in center of the screen.(Horizontal movement)
2. Adjust V. STAT magnet to converge red, green and blue dots in the center of the screen. (Vertical movement)
3. If the red, green and blue dots do not converge on the center of screen with H.STAT VR, perform horizontal convergence adjustment using H.STAT VR and V.STAT magnet as shown below. (In this case, H.STAT VR and V.STAT magnet effect each other.)

- Tilt the V.STAT magnet and adjust static convergence to open or close the V.STAT magnet.



4.When the V.STAT magnet is moved in the direction of arrow ⓐ and ⓑ, red, green and blue dots move as shown below.

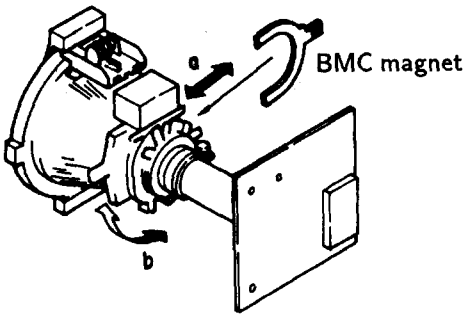


If the red and blue dot do not converge with green dots, perform following steps.

Move BMC magnet (a) to correct insufficient H.static convergence.

Rotate BMC magnet (b) to correct insufficient V.static convergence.

In either case, repeat Beam Landing Adjustment.

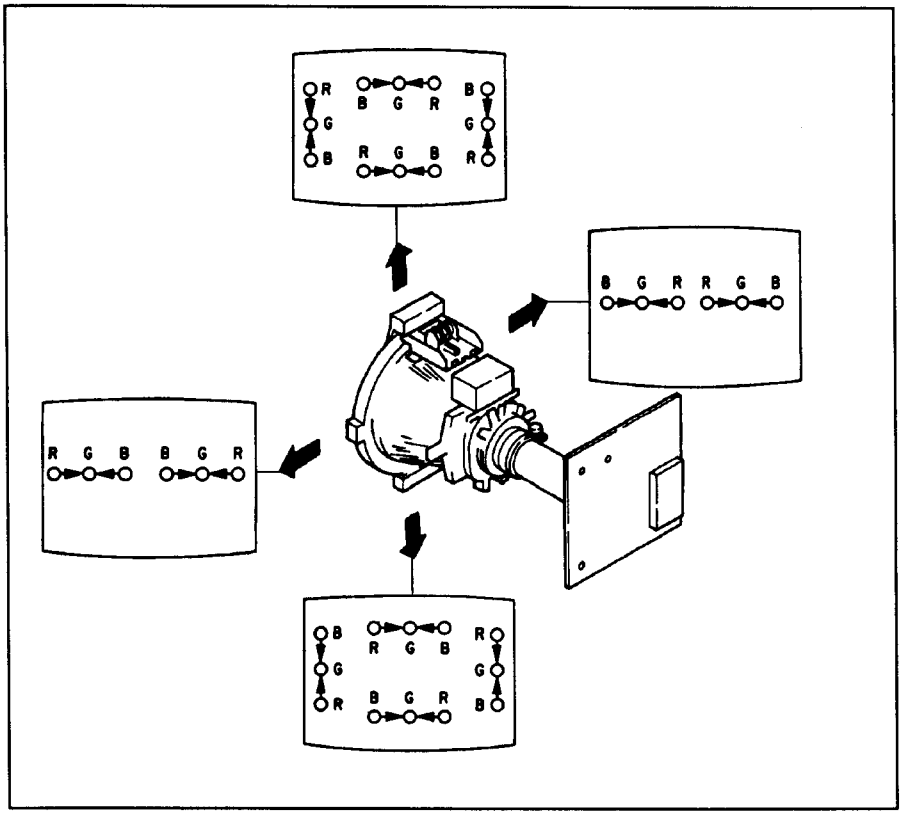


(2)Dynamic Convergence Adjustment

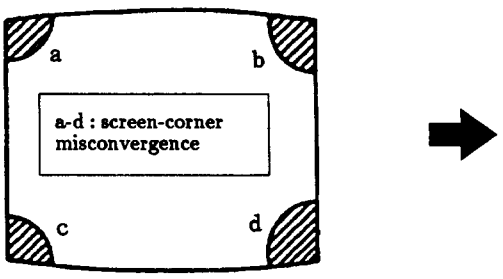
Preparation:

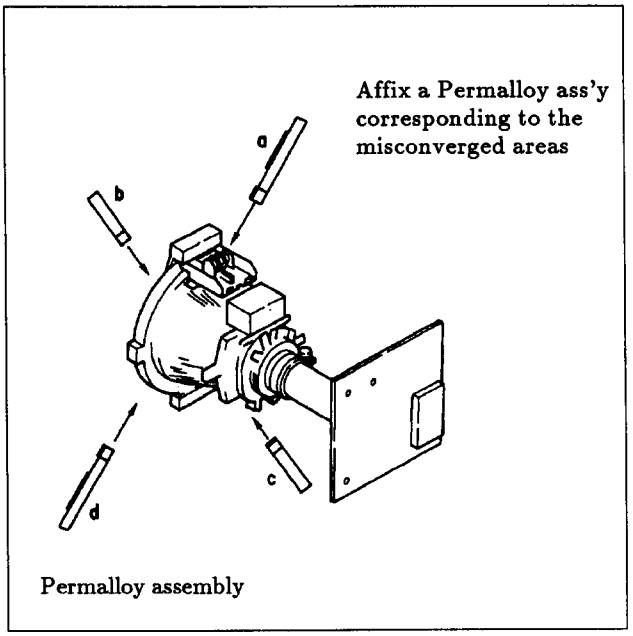
● Before starting perform Horizontal and Vertical static convergence Adjustment.

1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below.
4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.



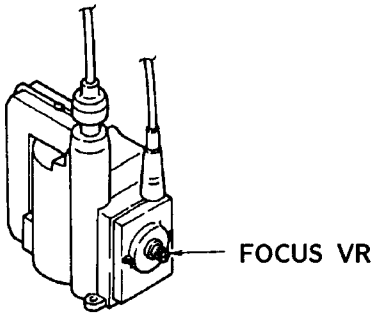
(3) Screen-corner Convergence



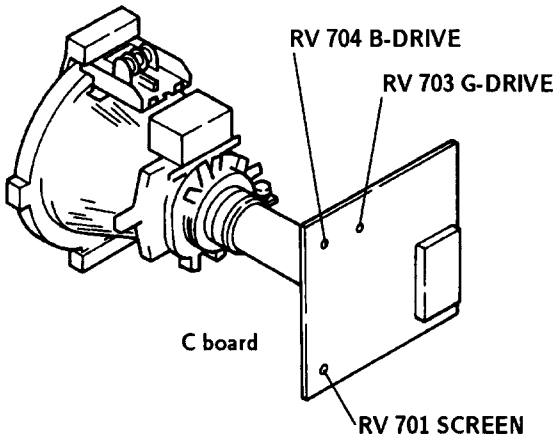


3-3. FOCUS

Adjust FOCUS so that the whole screen is in best focus.



3-4. SCREEN (G 2) and WHITE BALANCE



Screen (G 2) Setting

1. Input dot signal from the pattern generator.
2. Set the picture BRIGHTNESS control to minimum level.
3. Apply 170 V DC to the cathodes of R,G and B from an external power source.
4. While watching the picture, adjust the G2 control RV701 (SCREEN) immediately before fly-back line disappears.

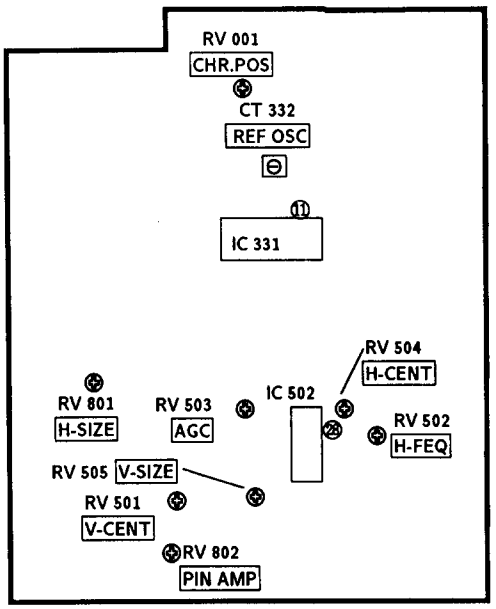
White Balance Adjustment

1. Input all-white signal from the pattern generator.
2. Adjust the BRIGHTNESS and COLOR controls to the standard level.
3. Adjust the following using RV 704 (B DRIVE) and RV 703 (G DRIVE)

In the following adjustments, the CONTRAST, COLOR and BRIGHTNESS controls are set to normal unless otherwise specified.

SECTION 4
CIRCUIT ADJUSTMENTS

4-1. A BORAD ADJUSTMENTS

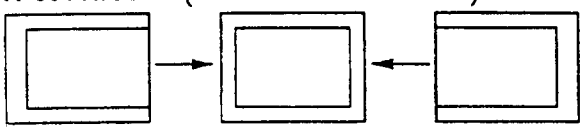


A BOARD
-Component side-

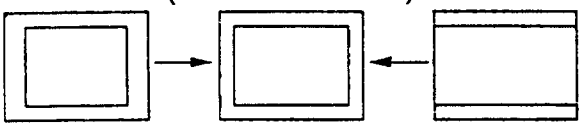
TU AGC Adjustment (RV 503)

1. Tune in air signal.
2. Adjust AGC VR (RV 503) so that snow-noise and cross-modulation just disappear from the picture.

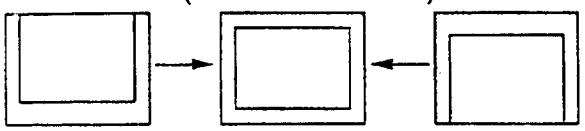
RV 504 H.CENT (HORIZONTAL CENTER)



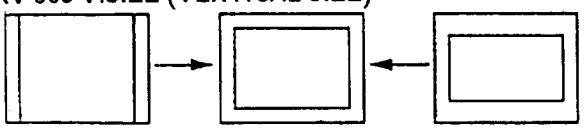
RV 801 H.SIZE (HORIOZONTAL SIZE)



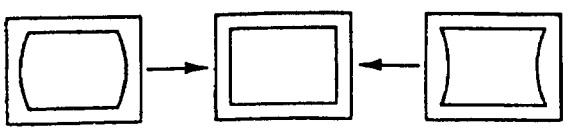
RV 501 V.CENT (VERTICAL CENTER)



RV 505 V.SIZE (VERTICAL SIZE)



RV 802 PIN AMP (PINCUSHION AMPLIFIER)



H.FREQ Adjustment (RV 502)

1. Input a PAL COLOR BAR signal, then connect an electrolytic capacitor (100 μ/16 V) between pin㉘ and GND of IC 502.
2. Adjust RV 502 (H.FREQ) to stop scrolling of the picture in the horizontal direction.
3. After adjustment, remove the electrolytic capacitor.

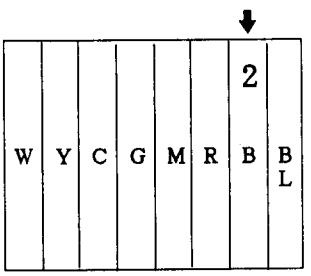
f 0 : too low
f0: suitable
f0: 15.625±50Hz
f 0 : too high

REF OSC 8.8 MHz Adjustment (CT 332)

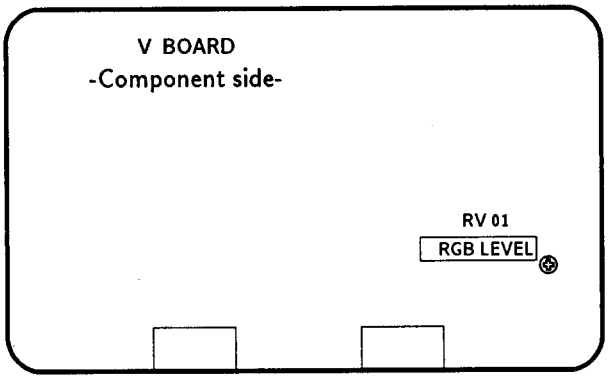
1. Input a PAL COLOR BAR pattern.
2. Short circuit between pin ⑪ of IC 331 and ground.
3. Adjust CT 332 to obtain color synchronizetion.
4. Remove the jumper wire from IC 331.

CHARACTER POSITION Adjustment (RV 001)

1. Input PAL COLOR BAR pattern.
2. Adjust RV 001 to position the charcter display at the point indicated by the arrow below.



4-2. V BOARD ADJUSTMENT (KV-M2151E only)

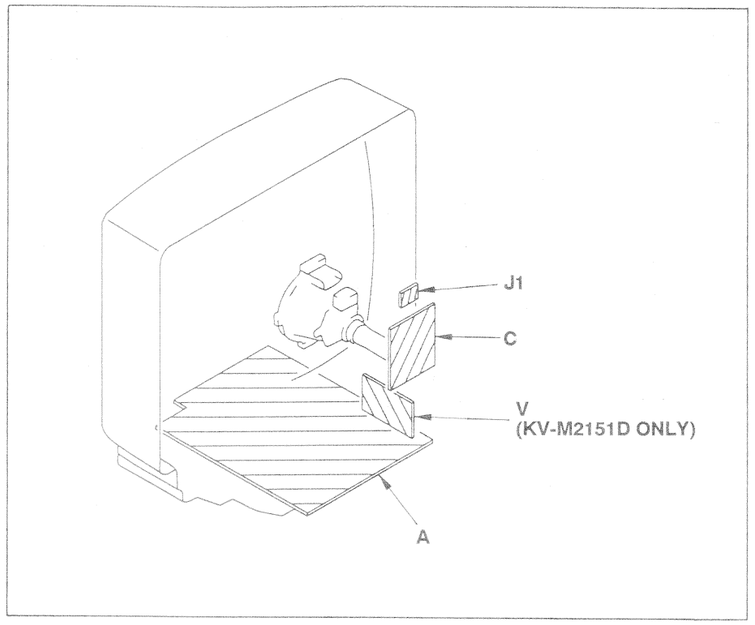


RGB LEVEL Adjustment (RV 01)

1. Set PICTURE to maximum.
2. Adjust RV01 till the RGB output becomes maximum.

SECTION 5
DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION



5-2. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.
  kΩ=1000Ω, MΩ=1000KΩ
- Indication of resistance, which does not have one for rating electrical power, is as follows.

  Pitch: 5 mm
  Rating electrical power ¼ W

- : nonflammable resistor.
- △ : internal component.
- : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊥ : earth-ground.
- ⏚ : earth-chassis.
- ⧺ : no mounted.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

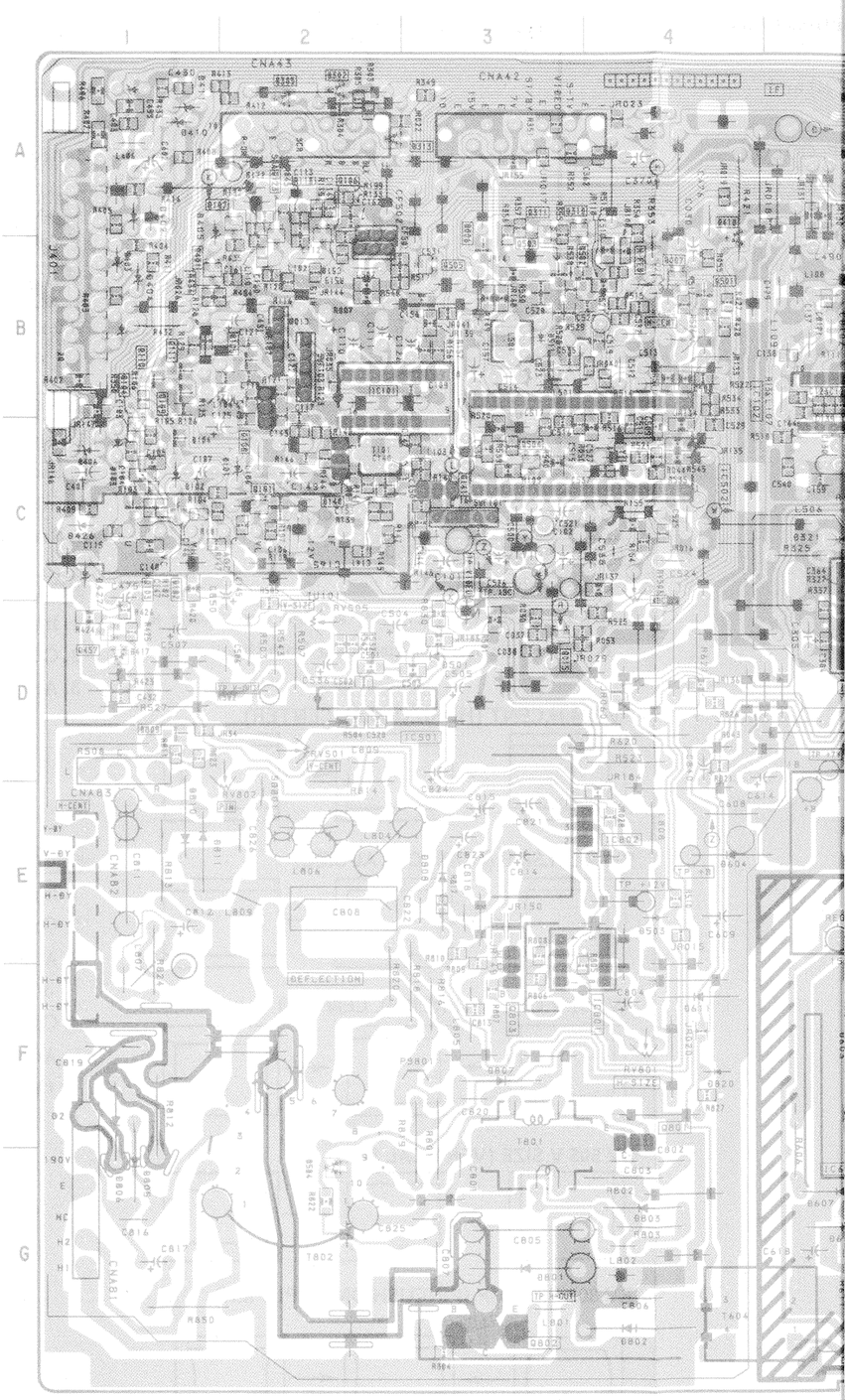
Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ※	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

- Readings are taken with a color-bar signal input.
  no mark : with PAL color-bar signal received.
  ( ) : with SECAM color-bar signal received.
- Readings are taken with a 10MΩ digital multimeter.
- Voltage are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
- : B+ bus.
- : signal path. (RF)

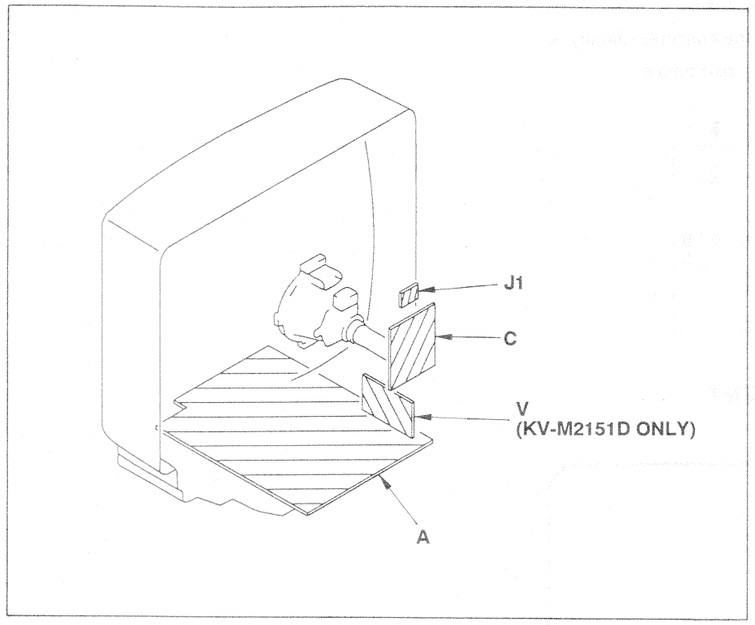
DIODE		DIODE		TRANSISTOR	
D002	E-10	D1301	B-10	Q305	B-6
D004	C-9	D1302	B-10	Q307	D-6
D007	B-8	D1303	B-10	Q310	A-3
D008	D-10	D1304	A-10	Q311	A-3
D009	B-8	D1305	A-10	Q401	B-1
D011	E-8	D1306	B-10	Q457	D-1
D020	B-8	D1307	B-10	Q504	C-3
D110	C-5			Q505	B-3
D301	C-6	IC		Q601	G-5
D302	A-2			Q801	F-4
D303	B-6	IC001	C-9	Q802	H-3
D305	A-2	IC002	D-9	Q803	F-3
D306	B-6	IC003	D-10	Q1301	B-9
D313	A-3	IC004	E-9	Q1302	B-10
D321	C-5	IC005	B-8	Q1303	B-10
D324	A-7	IC102	B-5	Q1304	A-10
D333	D-7	IC201	F-8	Q1305	A-10
D334	B-6	IC301	D-5	Q1306	B-10
D402	A-1	IC302	B-7		
D403	B-1	IC331	C-7	VARIABLE RESISTOR	
D404	B-1	IC501	D-2		
D405	A-1	IC502	C-4	RV001	D-9
D406	C-1	IC601	G-5	RV331	D-6
D411	A-1	IC801	F-3	RV501	D-2
D417	D-1	IC802	E-4	RV502	B-4
D418	A-4			RV503	C-4
D426	C-1			RV504	B-4
D427	C-1			RV505	D-2
D450	B-5	TRANSISTOR		RV801	F-4
D501	D-3				
D503	E-4	Q001	D-8	TRIMMER	
D504	G-2	Q003	C-9		
D519	C-8	Q004	D-10	CT332	C-7
D601	F-7	Q005	B-8		
D602	F-6	Q006	C-8		
D603	F-5	Q007	B-4		
D604	E-4	Q015	D-3		
D605	E-6	Q016	D-10		
D606	D-5	Q017	E-9		
D607	G-5	Q019	D-10		
D608	H-5	Q020	D-8		
D609	G-5	Q104	C-1		
D610	G-5	Q106	A-2		
D611	F-4	Q107	A-2		
D801	G-3	Q112	A-7		
D802	H-4	Q114	B-5		
D803	G-4	Q115	A-6		
D805	G-1	Q123	A-2		
D806	F-1	Q141	C-3		
D807	F-3	Q302	C-7		
D808	E-3	Q303	C-7		
D810	E-1	Q304	B-6		
D811	E-1				
D820	F-4				

— A Board —



SECTION 5
DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION



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	: RW	NONFLAMMABLE WIREWOUND
	: ※	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
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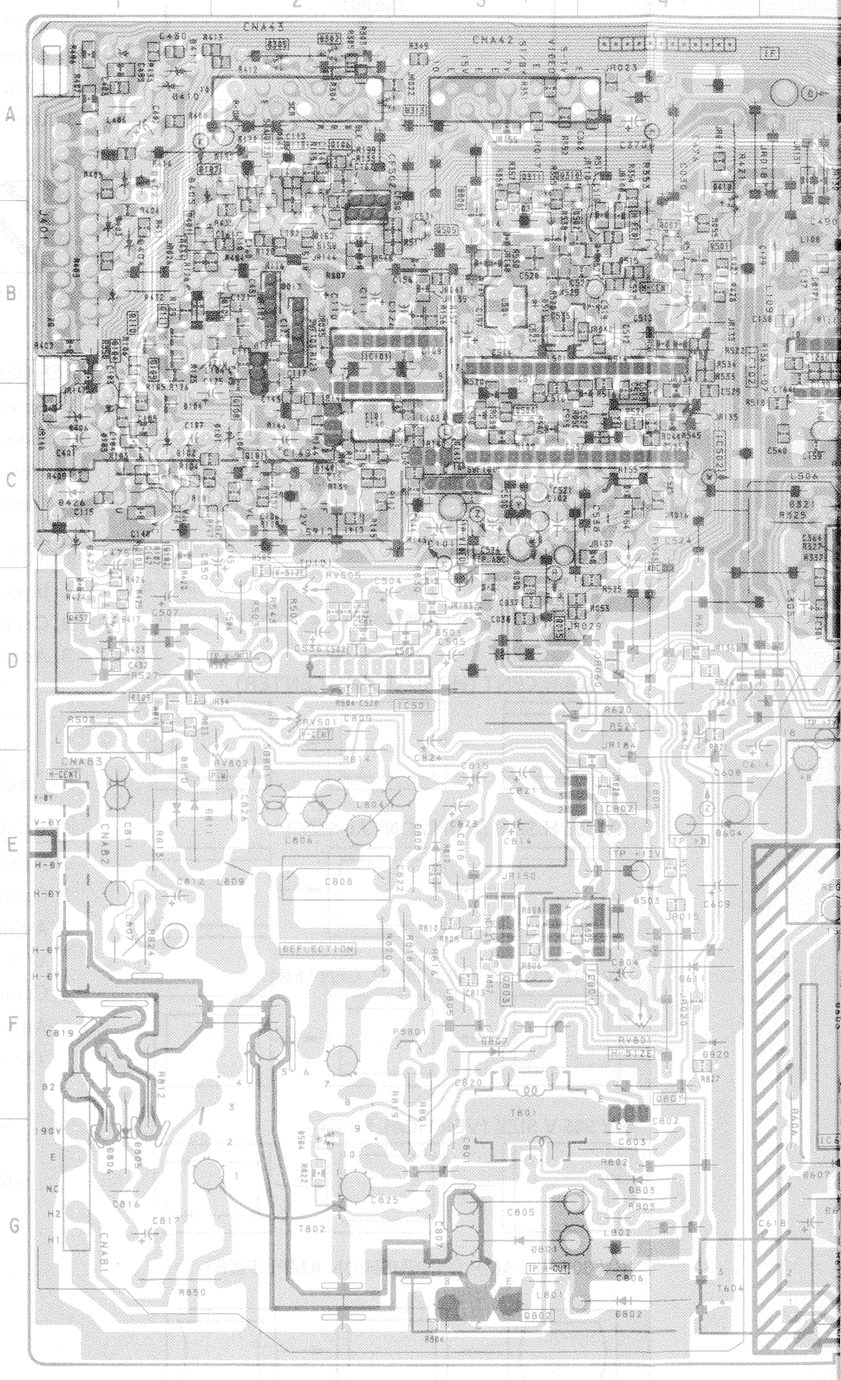
D008	D-10	D1304	A-10	Q311	A-3
D009	B-8	D1305	A-10	Q401	B-1
D011	E-8	D1306	B-10	Q457	D-1
D020	B-8	D1307	B-10	Q504	C-3
D110	C-5			Q505	B-3
D301	C-6	IC		Q601	G-5
D302	A-2	IC001	C-9	Q801	F-4
D303	B-6	IC002	D-9	Q802	H-3
D305	A-2	IC003	D-10	Q803	F-3
D306	B-6	IC004	E-9	Q1301	B-9
D313	A-3	IC005	B-8	Q1302	B-10
D321	C-5	IC102	B-5	Q1303	B-10
D324	A-7	IC201	F-8	Q1304	A-10
D333	D-7	IC301	D-5	Q1305	A-10
D334	B-6	IC302	B-7	Q1306	B-10
D402	A-1	IC331	C-7		
D403	B-1	IC501	D-2	VARIABLE RESISTOR	
D404	B-1	IC502	C-4	RV001	D-9
D405	A-1	IC601	G-5	RV331	D-6
D406	C-1	IC801	F-3	RV501	D-2
D411	A-1	IC802	E-4	RV502	B-4
D417	D-1			RV503	C-4
D418	A-4	TRANSISTOR		RV504	B-4
D426	C-1	Q001	D-8	RV505	D-2
D427	C-1	Q003	C-9	RV801	F-4
D450	B-5	Q004	D-10	TRIMMER	
D501	D-3	Q005	B-8	CT332	C-7
D503	E-4	Q006	C-8		
D504	G-2	Q007	B-4		
D519	C-8	Q015	D-3		
D601	F-7	Q016	D-10		
D602	F-6	Q017	E-9		
D603	F-5	Q019	D-10		
D604	E-4	Q020	D-8		
D605	E-6	Q104	C-1		
D606	D-5	Q106	A-2		
D607	G-5	Q107	A-2		
D608	H-5	Q112	A-7		
D609	G-5	Q114	B-5		
D610	G-5	Q115	A-6		
D611	F-4	Q123	A-2		
D801	G-3	Q141	C-3		
D802	H-4	Q302	C-7		
D803	G-4	Q303	C-7		
D805	G-1	Q304	B-6		
D806	F-1				
D807	F-3				
D808	E-3				
D810	E-1				
D811	E-1				
D820	F-4				

A [SYSTE
H/V OU

— A Board —

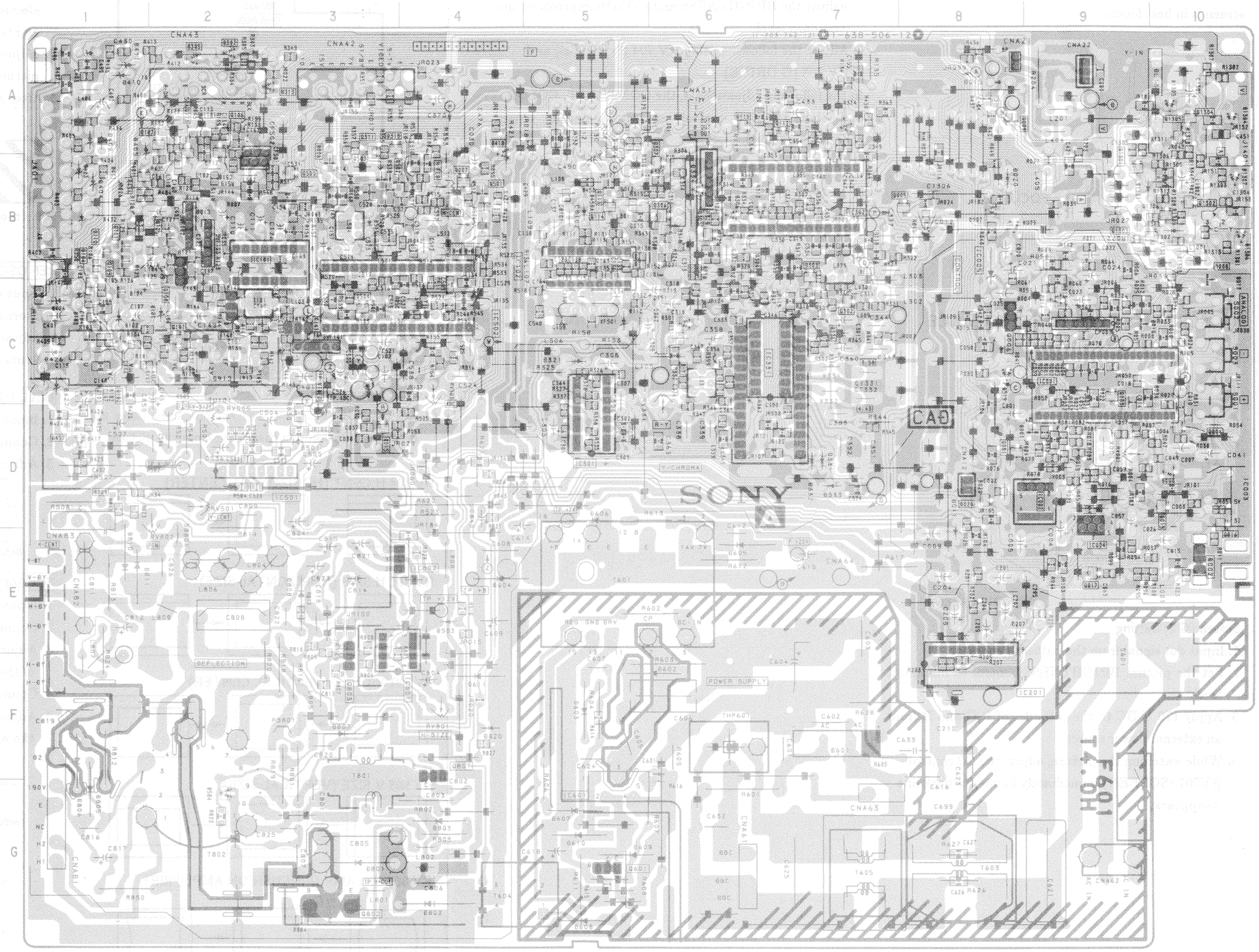


A [SYSTEM CONTROL, A/V OUT, H/V OUT, MEMORY, CHROMA]

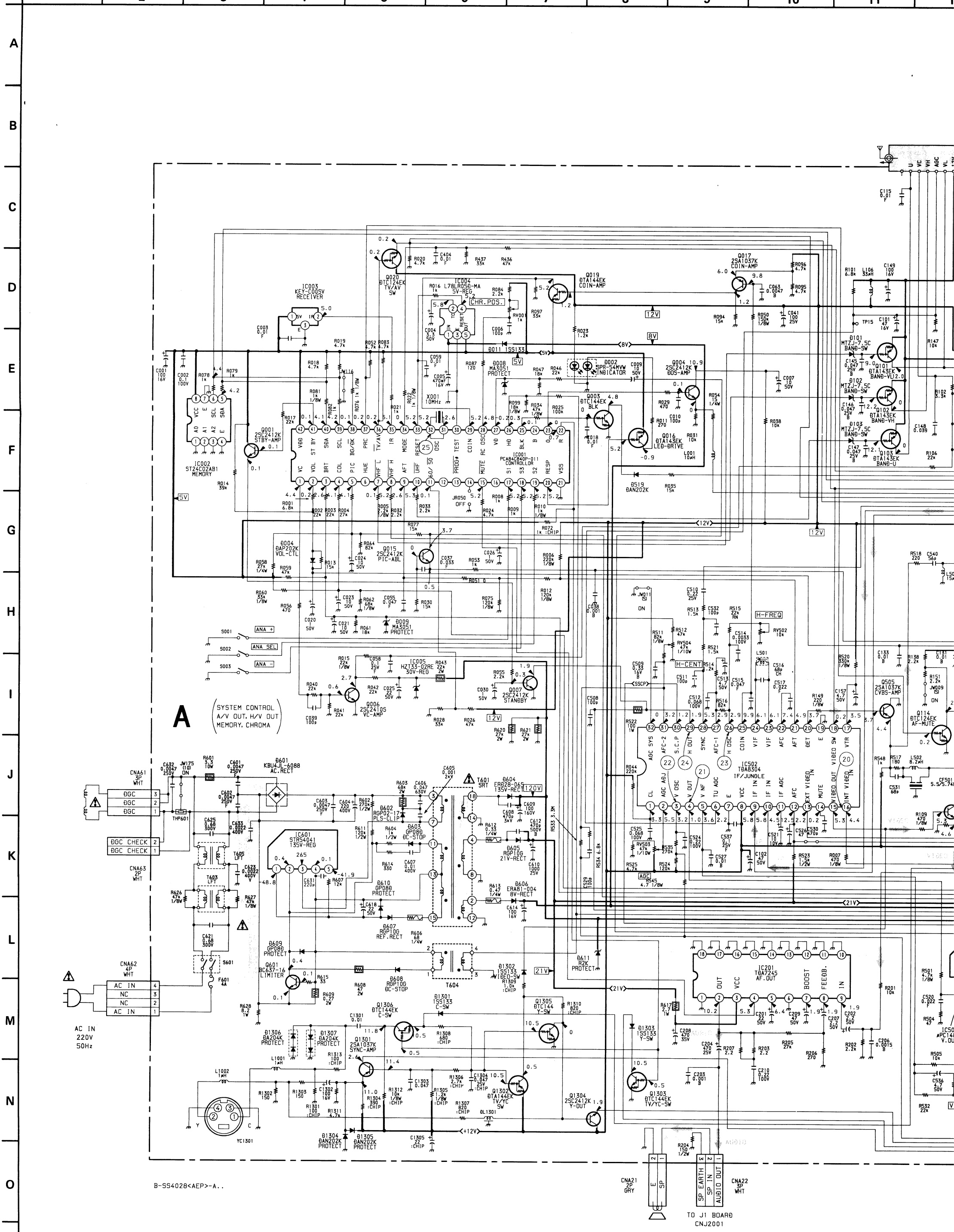
NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

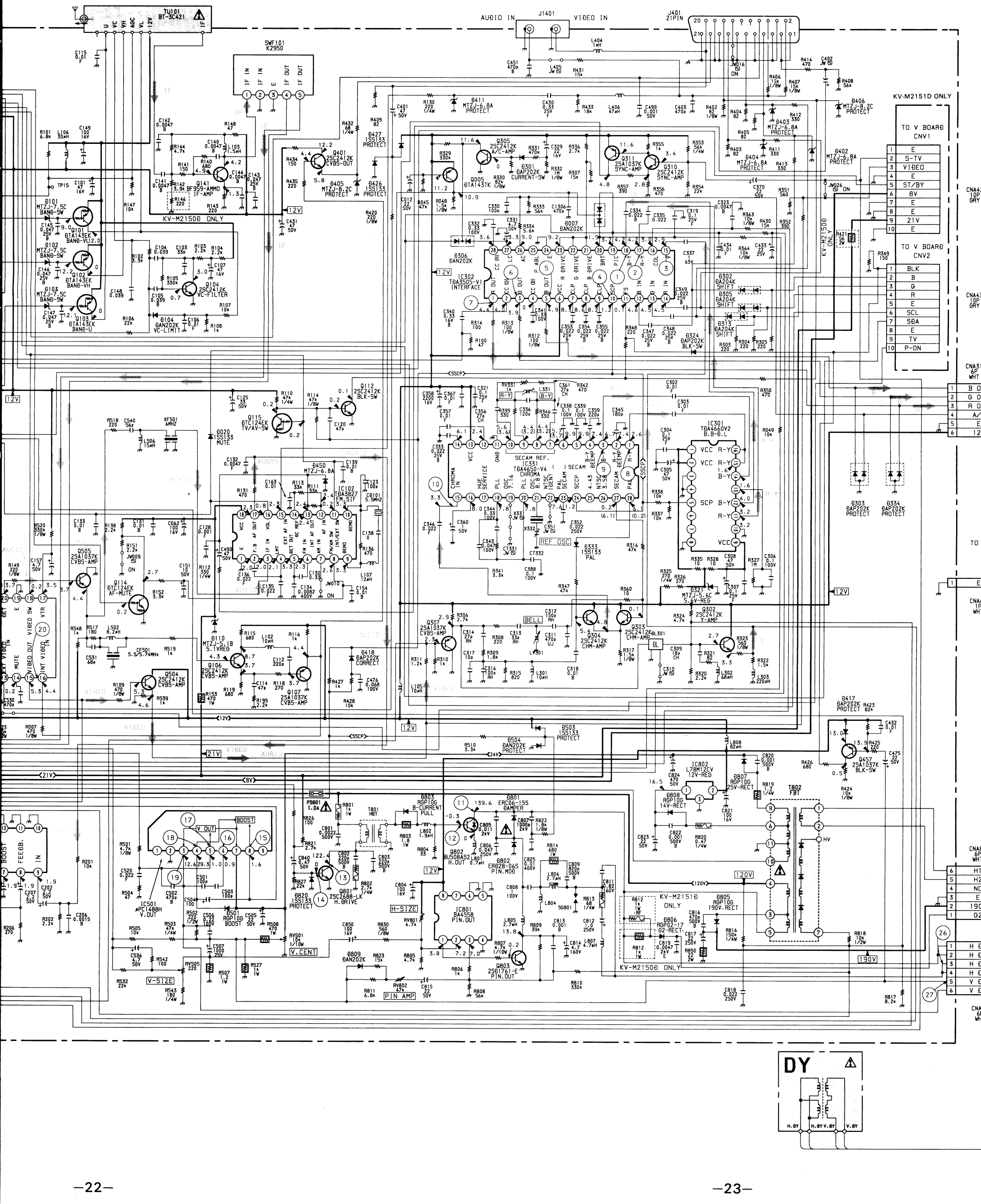
– A Board –

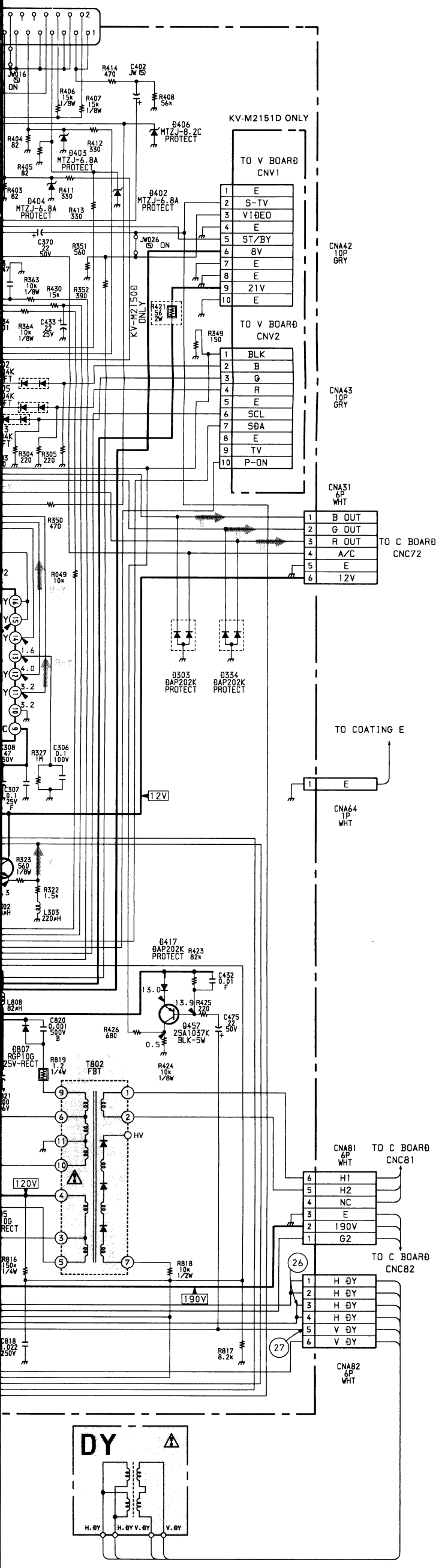
DIODE		DIODE		TRANSISTOR	
D002	E-10	D1301	B-10	Q305	B-6
D004	C-9	D1302	B-10	Q307	B-6
D007	B-8	D1303	B-10	Q310	A-3
D008	D-10	D1304	A-10	Q311	A-3
D009	B-8	D1305	A-10	Q401	B-1
D011	E-8	D1306	B-10	Q457	D-1
D020	B-8	D1307	B-10	Q504	C-3
D110	C-5			Q505	B-3
D301	C-6			Q601	G-5
D302	A-2	IC		Q801	F-4
D303	B-6			Q802	H-3
D305	A-2	IC001	C-9	Q803	F-3
D306	B-6	IC002	D-9	Q1301	B-9
D313	A-3	IC003	D-10	Q1302	B-10
D321	C-5	IC004	E-9	Q1303	B-10
D324	A-7	IC005	B-8	Q1304	A-10
D333	D-7	IC102	B-5	Q1305	A-10
D334	B-6	IC201	F-8	Q1306	B-10
D402	A-1	IC301	D-5		
D403	B-1	IC302	B-7		
D404	B-1	IC331	C-7	VARIABLE RESISTOR	
D405	A-1	IC501	D-2		
D406	C-1	IC502	C-4	RV001	D-9
D411	A-1	IC601	G-5	RV331	D-6
D417	D-1	IC801	F-3	RV501	D-2
D418	A-4	IC802	E-4	RV502	B-4
D426	C-1			RV503	C-4
D427	C-1			RV504	B-4
D450	B-5			RV505	D-2
D501	D-3	TRANSISTOR		RV001	F-4
D503	E-4				
D504	G-2	Q001	D-8	TRIMMER	
D519	C-8	Q003	C-9		
D601	F-7	Q004	D-10	CT332	C-7
D602	F-6	Q005	B-8		
D603	F-5	Q006	C-8		
D604	E-4	Q007	B-4		
D605	E-6	Q015	D-3		
D606	D-5	Q016	D-10		
D607	G-5	Q017	E-9		
D608	H-5	Q019	D-10		
D609	G-5	Q020	D-8		
D610	G-5	Q104	C-1		
D611	F-4	Q106	A-2		
D801	G-3	Q107	A-2		
D802	H-4	Q112	A-7		
D803	G-4	Q114	D-5		
D805	G-1	Q115	A-6		
D806	F-1	Q123	A-2		
D807	F-3	Q141	C-3		
D808	E-3	Q302	C-7		
D810	E-1	Q303	C-7		
D811	E-1	Q304	B-6		
D820	F-4				



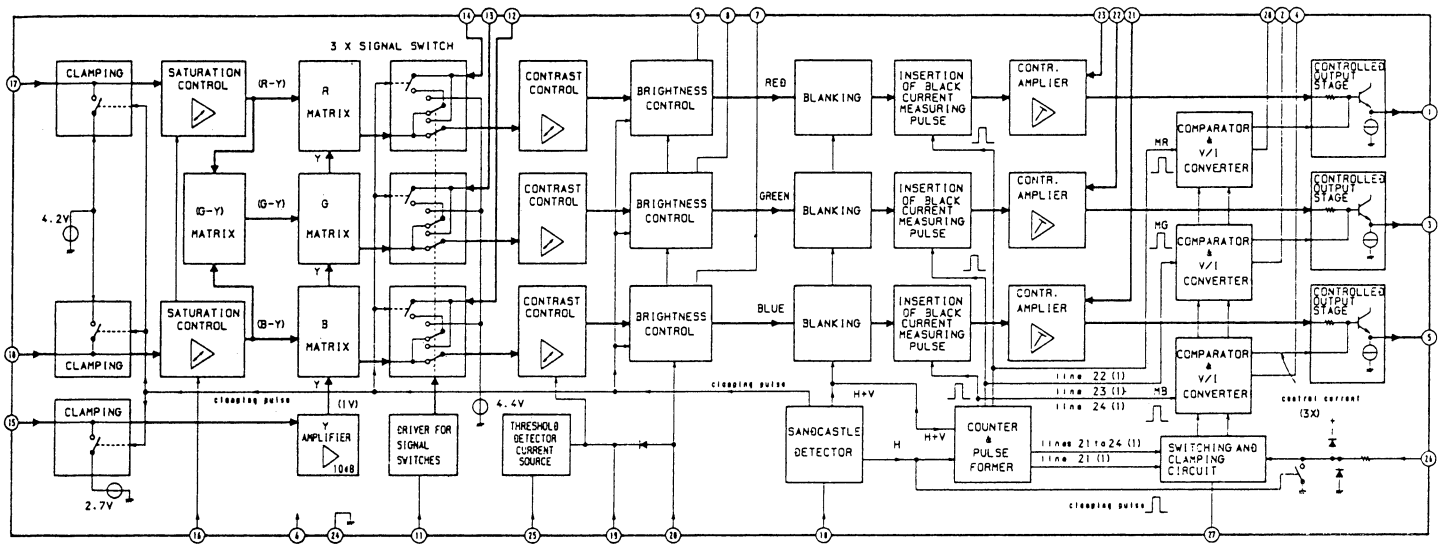
(1) Schematic Diagram of A Board



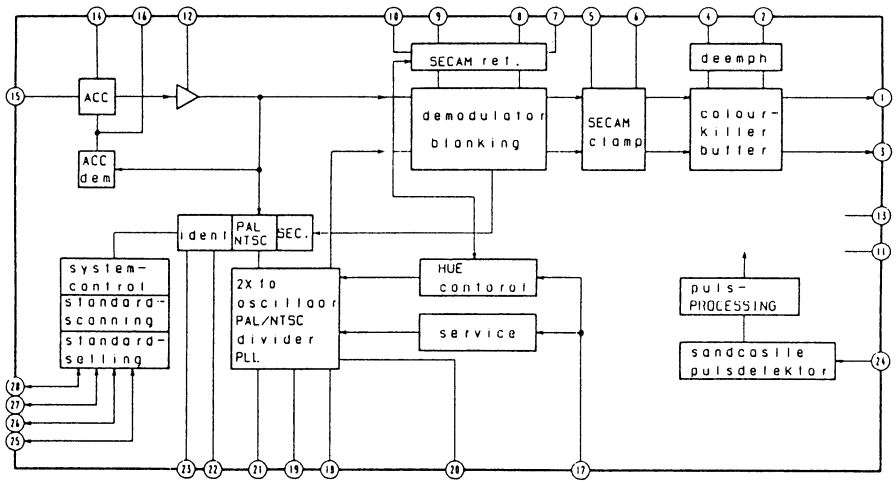

TU101 BT-3C421
SWF101 K2950
AUDIO IN J1401 VIDEO IN
J401 21PIN
KV-M2151D ONLY
KV-M2150D ONLY
TO V BOARD CNV1
TO V BOARD CNV2
IC302 T0A3505-V1 INTERFACE
IC331 T0A4650-V4 CHROMA
IC301 T0A4660V2 B.B-D.L
IC102 T0A3827 FM.SIF
IC801 BA4558 PIN.OUT
IC501 μPC1488H V.OUT
REF OSC
SECAM REF.
V-SIZE
V.CENT
PIN AMP
H-SIZE
DY



A Board IC302 TDA3505-V1



A Board IC331 TDA4650-V4



A BOARD WAVEFORMS

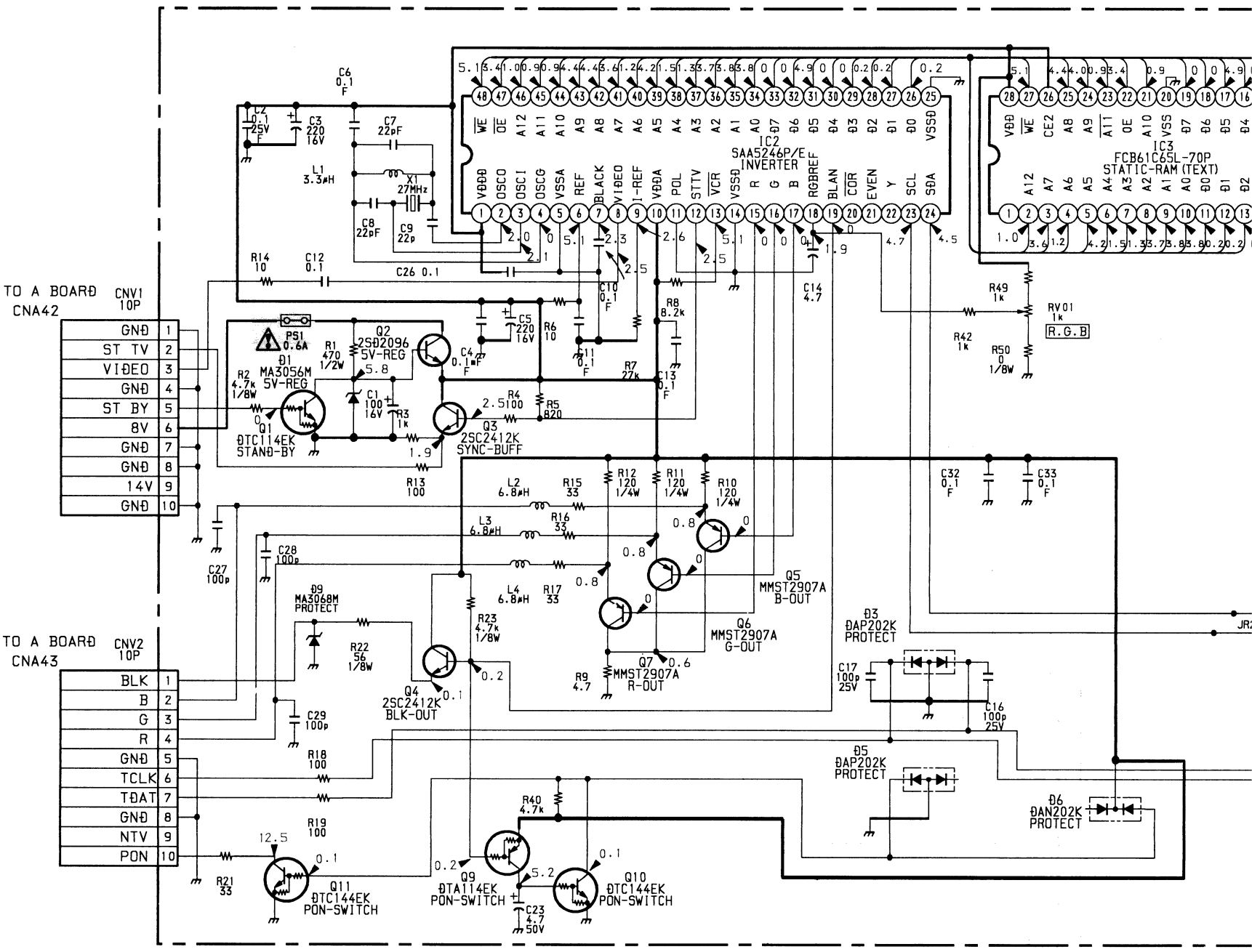
① 1.5Vp-p (H)	② 1.2Vp-p (H)	③ 0.38Vp-p (H)
④ 9.0Vp-p (H)	⑤ 2.4 Vp-p (H)	⑥ 2.5 Vp-p(H)
⑦ 2.5Vp-p (H)	⑧ 0.6Vp-p (H)	⑨ 0.6 Vp-p (H)
⑩ 0.24Vp-p (H)	⑪ 750Vp-p (H)	⑫ 12 Vp-p (H)
⑬ 320Vp-p (H)	⑭ 1.5Vp-p (H)	⑮ 1.7Vp-p (V)
⑯ 2.5Vp-p (V)	⑰ 1.5Vp-p (V)	⑱ 2.2Vp-p (V)

B-554030<ET.>-A<WAVELIST>-1

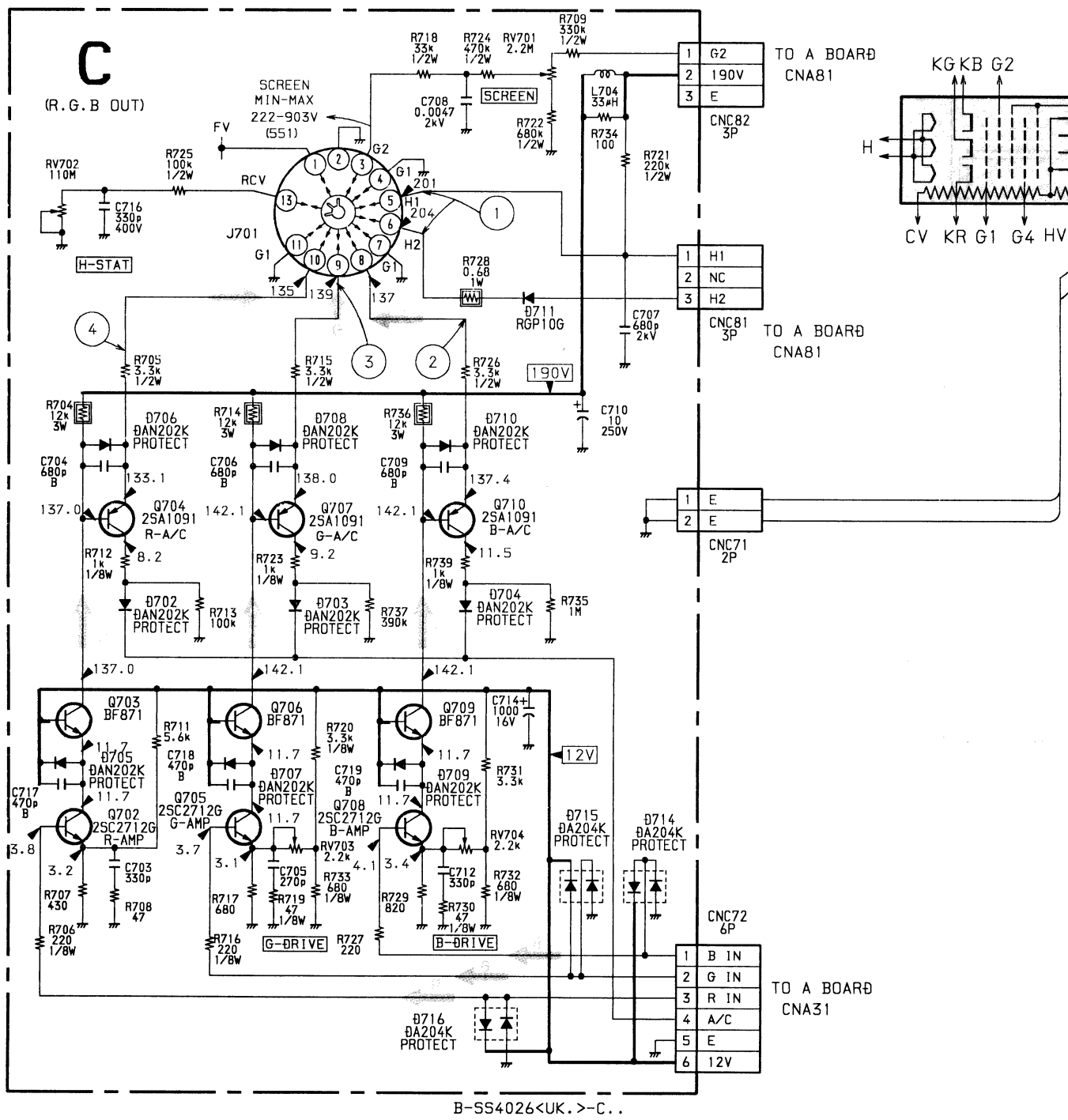
⑲ 50Vp-p (V)	⑳ 1.7Vp-p (H)	㉑ 5.2 Vp-p (V)
㉒ 2.0Vp-p (V)	㉓ 2.2 Vp-p (H)	㉔ 4.0 Vp-p(H)
㉕ 1.7Vp-p (10MHz)	㉖ 200Vp-p(H)	㉗ 4.2 Vp-p (V)

B-554030<ET.>-A<WAVELIST>-2

(KV-M2151D ONLY)

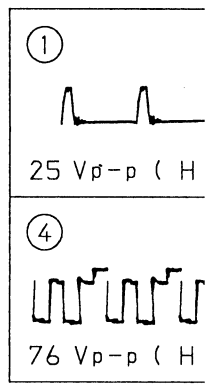


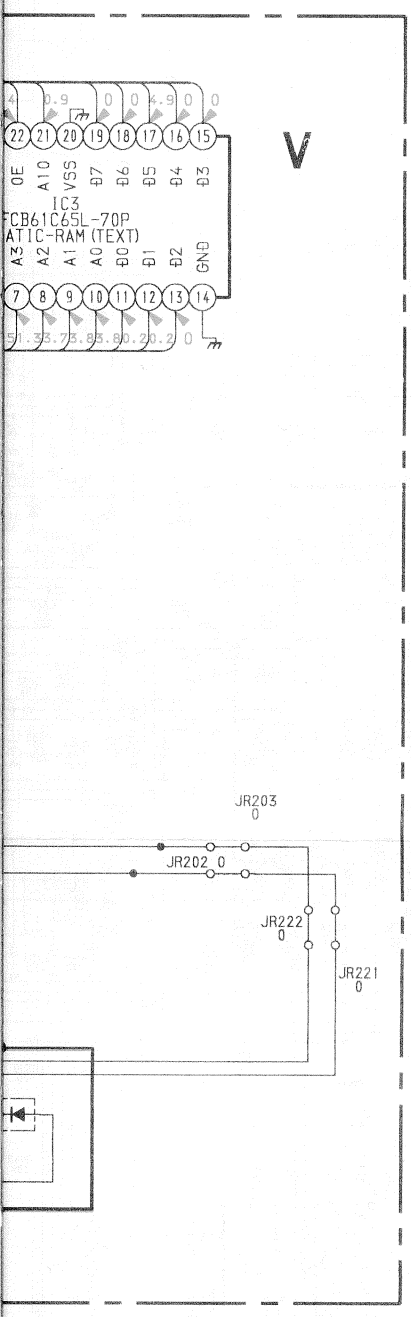
B-SS402



B-SS4026<UK.>-C..

C BOARD WAVE



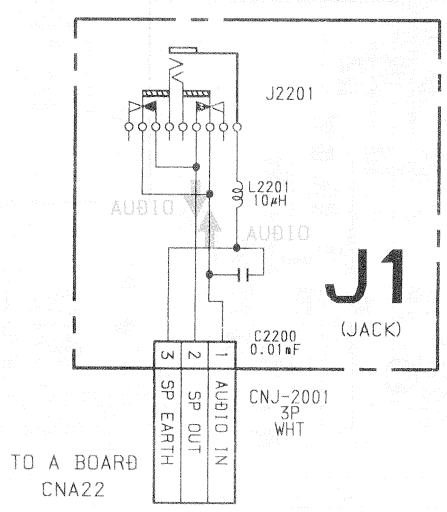


B-SS4026<UK.>-V.

C BOARD WAVEFORMS

① 25 Vp-p (H)	② 68 Vp-p (H)	③ 70 Vp-p (H)
④ 76 Vp-p (H)		

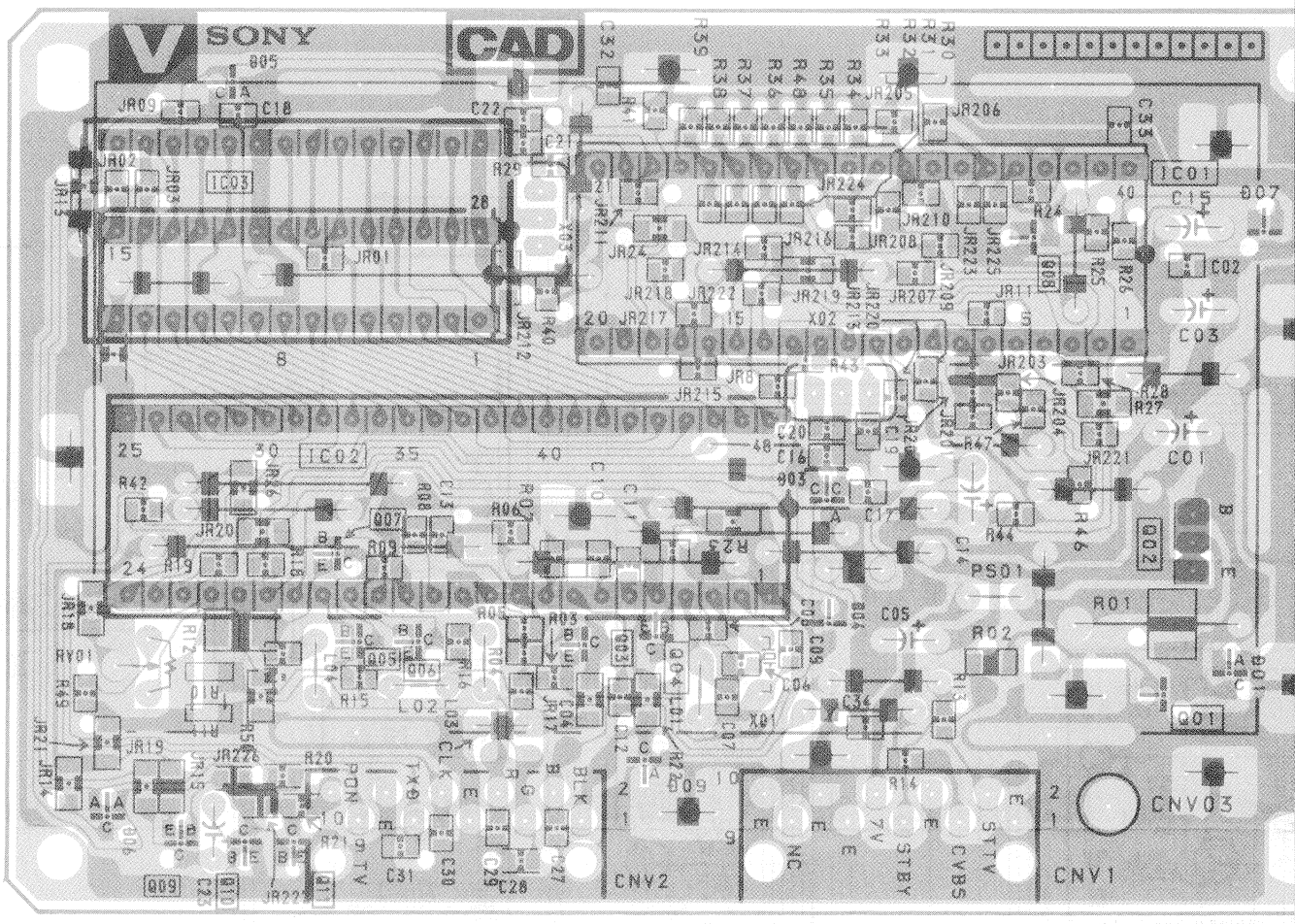
B-SS4030<ET.>-C<WAVELIST>



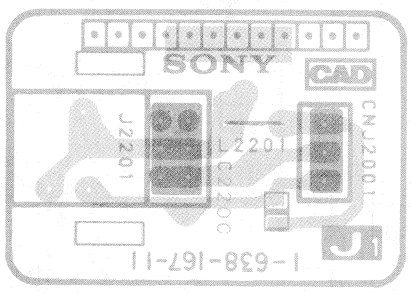
B-SS4026<UK.>-J1.

V [TELE TEXT] C [R, G, B OUT] J1 [JACK]

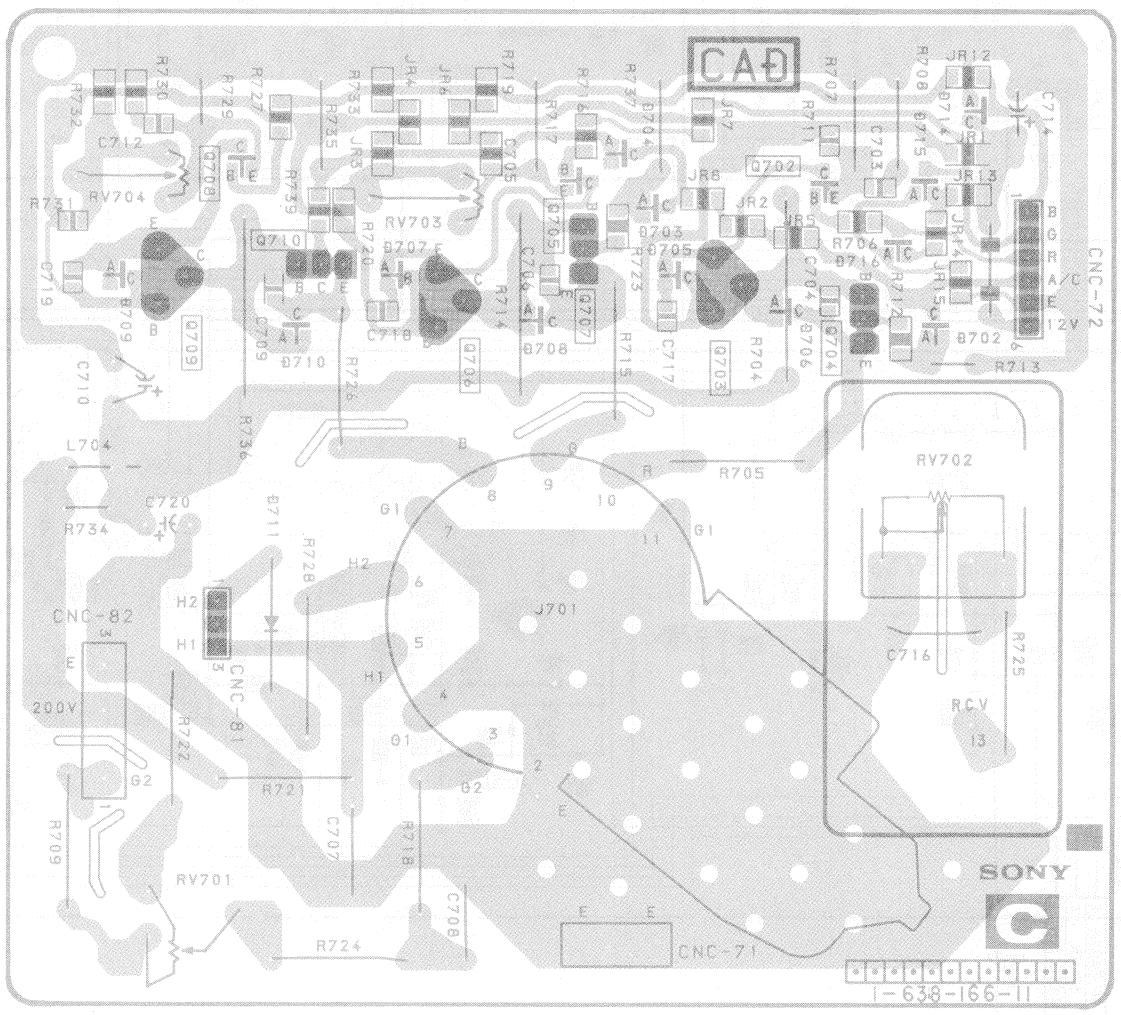
— V Board — (KV-M2151D ONLY)



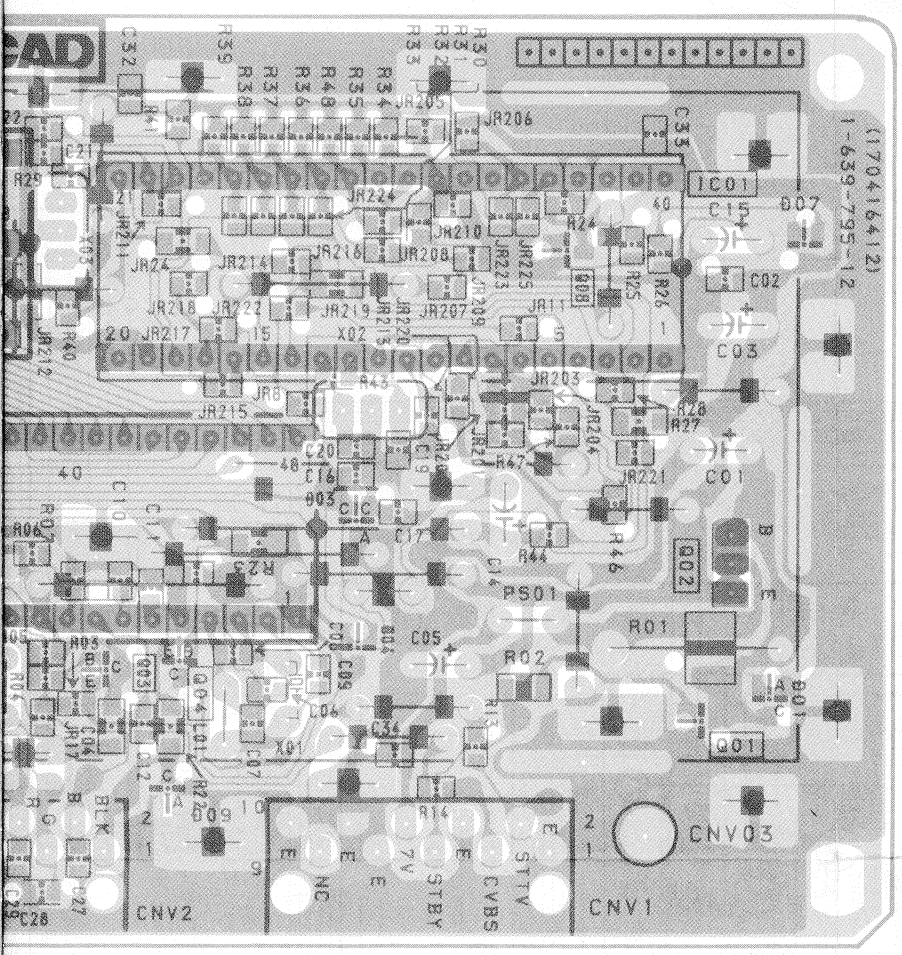
— J1 Board —

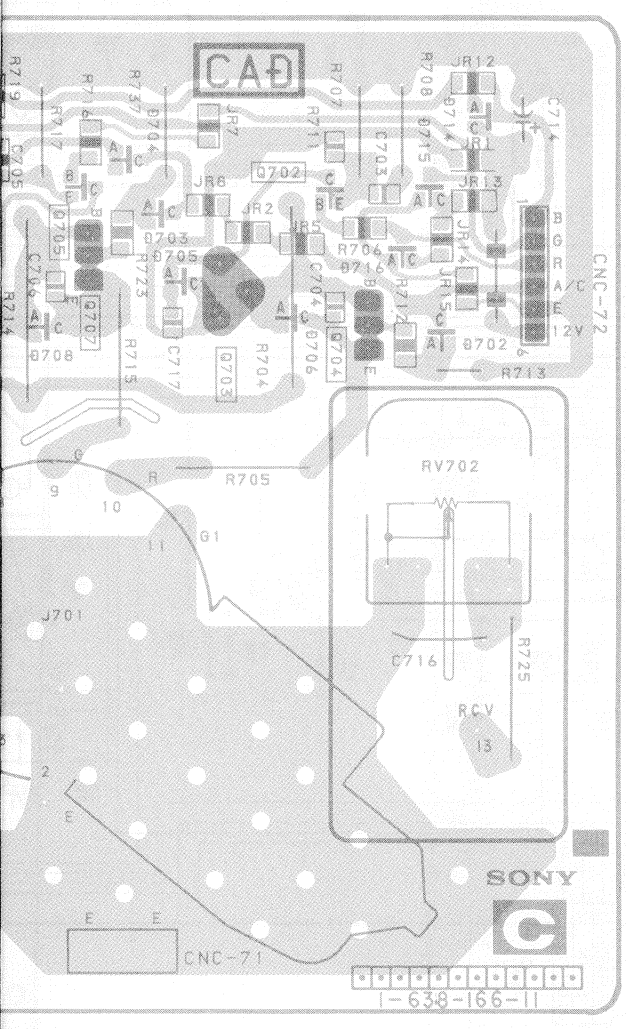


— C Board —



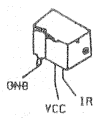
J1 [JACK]



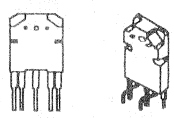


5-3. SEMICONDUCTORS

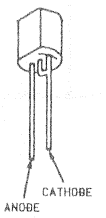
KEY-C00SV-F



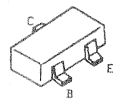
STR54041



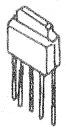
μPC574J



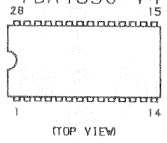
ÐTA114EK
ÐTA143EK
ÐTA143TK
ÐTA144EK
ÐTC114EK
ÐTC124EK
ÐTC144EK
MMST2907A
2SA1037K
2SA1162-G
2SB1295-UL6
2SC1623-L5L6
2SC2412K
2SC2712G
2SC2712-YG



L78LR05Ð-MA

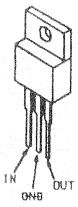


TÐA3505-V1
FCB61C65L-70P
TÐA4650-V4



BC637-16

M5F78M12L



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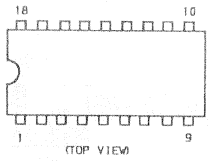
TÐA7245



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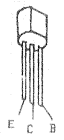

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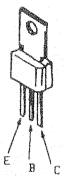

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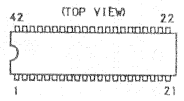

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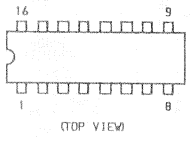

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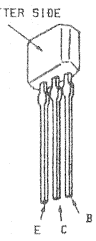

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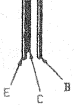

TÐA8304

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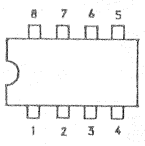

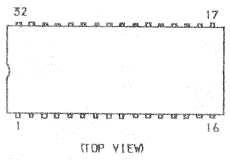

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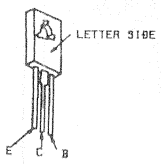

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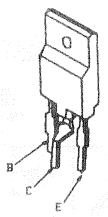

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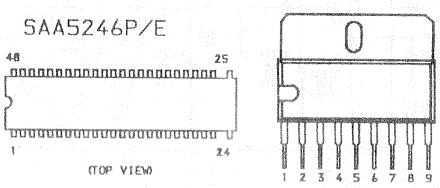

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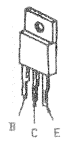

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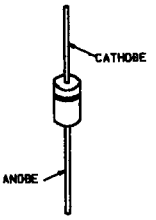
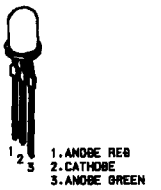
ERC06-15S



SPR-54MVW



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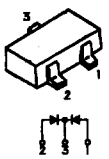

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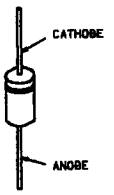
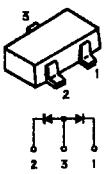
ERD28-08S
RGP02-17
RGP10G
RU-3AM
R2K



DAP202K
1S2836



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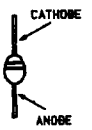
U05G



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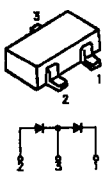

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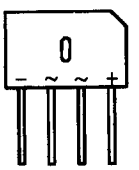
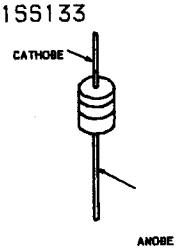


ERA83-006
RD5.1ES-B2
RD5.6ES-B2
RD6.8ES-B2
RD7.5ES-B2
RD8.2ES-B2
1SS119
1SS133



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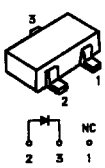
MA3056M
MA3068M
RD5.1M-B2
RD5.6M-B2
RD6.8M-B2



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